

U.S. EDI MARKET

1991 - 1996

INPUT

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N O V E M B E R 1 9 9 1

THE U.S. ELECTRONIC DATA INTERCHANGE MARKET

1991-1996



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Electronic Data Interchange Program (EDIP)

***The U.S. Electronic Data Interchange Market,
1991-1996***

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Abstract

This report defines the current state of the U.S. EDI marketplace, and provides detailed estimates of current (1991) and future (through 1996) user expenditures for EDI products and services. Specific industry trends are identified, and usage characteristics, profiles and patterns are described and analyzed.

The report notes the most significant issues now facing the EDI industry, analyzes them, and offers a series of recommendations for EDI users and vendors. A number of industries offering unusual vendor opportunities are identified.

This report is 103 pages long and contains 52 exhibits. An index of companies mentioned in the report is included.

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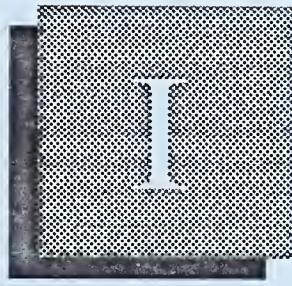
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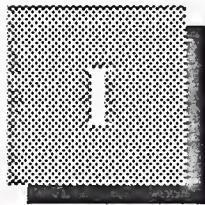
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Introduction



Introduction

This report, produced as part of INPUT's Electronic Data Interchange Program, examines the EDI market in the United States.

A

Scope of the Report

INPUT defines EDI as the application-to-application exchange of intercompany business data in structured, standard data formats. Business data typically includes invoices, purchase orders, shipping documents, and other information that companies exchange with each other during the course of commercial transactions.

This report focuses on third-party EDI service and software markets in the United States and excludes consumer applications such as electronic shopping, electronic banking, automatic teller networks (ATMs), point-of-sale (POS) data/funds transfers, airline reservation systems, credit authorization systems, and other captive networks that are used for transactions between two parties. Although these systems do use structured data formats to transfer information, the applications generally use specialized terminal devices to communicate with dedicated computers, are not computer-to-computer, application-to-application implementations, and use proprietary data formats rather than public standards.

The report is designed to assist vendors in:

- Identifying new markets and product opportunities
- Assessing product and marketing risk exposure
- Allocating research, development, and operational resources
- Gaining insights into market developments

The report also helps EDI users to:

- Become familiar with the various applications of EDI throughout industries and sectors of the economy

- Understand product trends for EDI and how other users are implementing EDI systems
- Become familiar with the vendors of the EDI market

This report reviews the state of EDI use within the economy, how it is being applied in selected industrial/commercial sectors, the concerns and practices of EDI users today, how much users are spending on EDI products and services, how much the market for these products and services will grow through 1996, who the leading vendors of these products and services are, and the features and characteristics of these products and services.

B

Data Collection

INPUT prepared this report using data gathered from surveys and interviews of EDI users, representatives of industry trade associations, and vendors of EDI products and services. In addition, a variety of published material was used, including vendor annual reports, and articles drawn from a broad spectrum of the print media.

1. Interviews

a. Surveyed EDI Users

Using a structured questionnaire, INPUT surveyed a total of 48 user companies. Respondents at these companies were directly involved in the company's EDI program and were typically an EDI project director, EDI systems analyst, or functional manager (such as purchasing).

A copy of the questionnaire is contained in Appendix D.

Exhibit I-1 lists the kinds of companies interviewed for this report.

EXHIBIT I-1

User Company Types Interviewed

Industry Type	Number of Companies
Discrete manufacturing	17
Process manufacturing	7
Distribution (retail & wholesale)	4
Transportation	4
Telecommunications	3
Banking	4
Government	2
Insurance	1
Consumer products	1
Construction/engineering	1
Mining	1
Business services	3
Total	48

b. Other EDI Users

In addition to the survey, INPUT maintains continuous contact with a broad range of EDI users, especially in conjunction with the publication of its *EDI Reporter* newsletter. Information obtained from conversations with these users also contributed to this report.

c. Associations

INPUT has an ongoing dialogue with the major EDI industry trade associations. The information and opinions offered during a broad range of interactions has been factored into this report.

Exhibit I-2 lists the industry trade associations with which INPUT maintains ongoing relationships.

EXHIBIT I-2

Trade Associations

- Health Insurance Business Communications Council
- National Wholesale Druggists Association
- National Electrical Manufacturers Association
- Electronics Industries Data Exchange (EIDX)
- Aerospace Industries Association of America
- National Automated Clearinghouse Association (NACHA)
- Cal Western Automated Clearinghouse
- National Customs Brokers and Forwarders Association of America
- Automotive Industry Action Group (AIAG)
- Voluntary Inter-industry Communication Standard (VICS)
- American Trucking Association
- American Association of Railroads
- Construction Industry Institute
- Uniform Code Council
- Chemical Industry Data Exchange (CIDX)
- Utility Industry Group
- Printing Industries of America
- Graphic Communication Association
- American Paper Institute
- National Association of Purchasing Management
- Insurance Value Added Network Service (IVANS)

d. Vendors

INPUT is continually canvassing vendors of EDI services and products. Communications occur for many reasons—to serve INPUT client consulting requests, to report on news in INPUT's *EDI Reporter International*, to stay current with developments in the EDI world, to update INPUT's information bank, and to gather data for this and other reports.

Vendor communications take place over the phone, in person during visits between INPUT and vendors, and in person during EDI conferences and meetings. INPUT maintains active contact with over 25 software vendors and 15 services companies that participate in the EDI market.

2. Product, Service and Industry Analysis

INPUT collected and analyzed information on EDI services and vendors planning EDI services, and reviewed secondary research sources. Additionally, INPUT monitored industry publications, attended conferences, and secured other relevant research data in the process of preparing this study.

3. Related Program and Custom Research

INPUT has been engaged in several consulting projects concerning EDI and has published a variety of other publicly available research reports on EDI. Although no proprietary information from the custom research is revealed, the general industry knowledge gained is presented in this report.

C

Report Structure

The report is structured in the manner noted and addresses the following topics:

Chapter II is an Executive Overview of the entire study.

Chapter III is a background and tutorial on EDI that reviews the rationale, product and service needs, and objectives of companies that implement EDI.

Chapter IV contains market forecasts and user expenditure estimates for services and software, and presents an overall market forecast.

Chapter V reviews the trends in vendor software, network and professional services offerings, and examines significant issues defined during dialogues with EDI vendors and users.

Chapter VI examines the competitive environment, identifies the major EDI service vendors, and offers brief commentary on a representative selection of their products.

Chapter VII presents conclusions and recommendations for EDI users and vendors.

Appendix A refers the reader to sources of definitions used in this report.

Appendix B contains the forecast data base.

Appendix C contains the reconciliation between INPUT's 1990 forecast for the EDI market and the 1991 forecast.

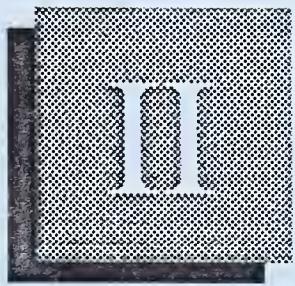
Appendix D contains the survey questionnaire completed by EDI users.

D

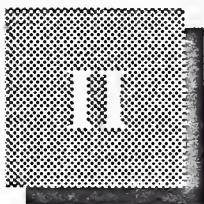
Related INPUT Reports

This study is one of a continuing series focused on EDI. Other reports (with their respective publication years) in the series include:

- *Developments in Corporate Electronic Trade Payments (1991)*
- *Electronic Commerce: The New Foundation for Trade (1991)*
- *Electronic Commerce in U.S. Health Care (1991)*
- *Electronic Commerce in Trade and Transportation (1991)*
- *Electronic Commerce in Food Production and Distribution (1991)*
- *Electronic Commerce in Apparel Production and Distribution (1991)*
- *Electronic Commerce in the U.S. Federal Government (1991)*
- *North American EDI Service and Software Provider Profiles (1991)*
- *EDI: Business Integration Issues (1990)*
- *The EDI Market: 1990-1995 (1990)*
- *Western European EDI Market: 1990*
- *Western European Electronic Information Services: 1990*
- *Financial Network Services in Western Europe: 1990*
- *Advanced EDI Services (1989)*
- *EDI Standards Reference Guide (1989)*
- *EDI Implementation Case Studies (Volumes I and II) (1988, 1989)*
- *EDI and X.400 (1988)*



Executive Overview



Executive Overview

A

Market Direction

While the overall proportion of commercial transactions facilitated by EDI grows slowly, EDI is being implemented in more and more diverse industries (such as education, construction, and film distribution). Although the U.S. economy continues to display recessionary characteristics, EDI continues to grow at a steady rate. INPUT expects this moderate growth rate to continue for the forecast period.

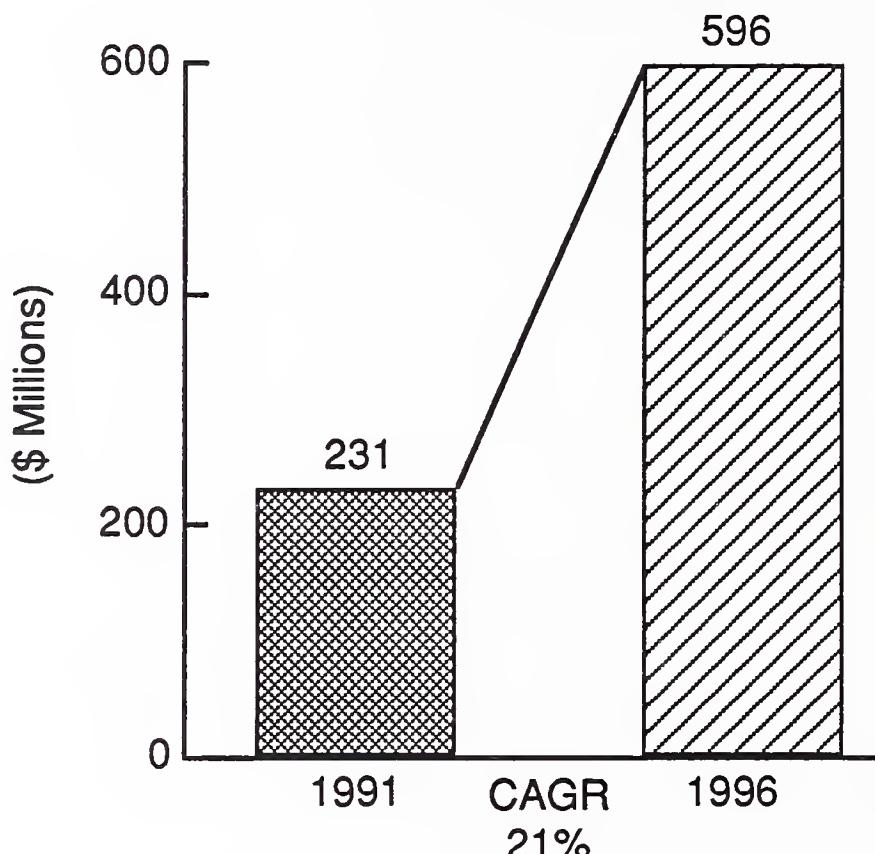
One reason growth is slow is that many who attempt to implement EDI underestimate the level of commitment required, become discouraged, and revert to their old system. Other reasons include a lack of critical mass and the absence of strong, industry- or economy-wide imperatives supporting EDI. However, slow is a relative term, and even though EDI has never quite lived up to its initial proponents' enthusiastic growth projections, EDI users do project, over the period 1992-1996, a 22% compound annual growth rate (CAGR) in their expenditures for EDI network services, a 19% CAGR for EDI software services, a 20% CAGR for EDI-related professional services, and an overall CAGR of 21% for all EDI expenditures. This growth is noted in Exhibit II-1, The U.S. EDI Services and Software Market, 1991-1996.

A few large companies (such as GEIS, Sterling and IBM) will continue to be the dominant vendors of EDI products and services across all EDI product and service market segments. Within each market segment, the top two vendors (in terms of annual sales of EDI products and services) account for 47% to 51% of all EDI sales to that market.

Although the software market is not growing quite as rapidly as the network services and professional services markets, it is still forecast to show a steady 19% CAGR from 1991 to 1996.

EXHIBIT II-1

The U.S. EDI Services and Software Market 1991-1996



Professional services, although currently experiencing the effects of user spending constraints due to the recession and a slowing of new installation activity as fewer new (to EDI) customers install systems, can still be expected to show a 20% CAGR over the next five years. Although revenues are temporarily down, so are the staffs of the PS vendors, allowing efficient operation and good profit potential in the current market, while providing the nucleus for growth as the market expands.

Improved operational efficiency has emerged as the primary objective of EDI programs, and the most frequently observed benefit. And regardless of company size or industry grouping, the most popular perceived EDI benefit is its improvement in the way companies do business—not to gain strategic advantage, as was once cited by users. This recognition is further evidence that the market has matured, and that EDI is required more to maintain competitive parity than to gain competitive advantage.

When asked what they felt the main issues were regarding EDI, vendors of EDI products and services most frequently responded that increasing the size, diversity and transaction volume of the EDI user community was most important.

B**Market Opportunities**

Despite slow growth in absolute numbers of users, the EDI market is still wide open to growth in other dimensions. Such dimensions include the number of trading relationships (different than absolute number of users), the provision of advanced services, developing new EDI applications, and offering systems integration. Market opportunities exist for network providers, software vendors and professional services firms in such areas as targeting vertical industries, the provision of systems integration support, offering advanced services and new features, targeting hub companies, and through carefully chosen alliances.

The applicability of these opportunities to the three vendor categories are noted in Exhibit II-2.

EXHIBIT II-2

**Growth Opportunity
Recommendations for EDI Vendors**

Recommendation	Network Providers	Software Providers	Professional Services Firms
Target vertical industries	X		X
Offer systems integration support	X	X	X
Offer advanced services and new features	X	X	
Target hub companies	X		X
See alliances	X	X	X

To remain profitable, vendors must pursue these other dimensions by enhancing existing offerings, developing new offerings, and expanding markets. Already new advanced EDI network services are being offered, such as financial EDI, transaction data bases, the sending of CAD/CAM files attached to EDI documents, media conversion services, inter-net-working, and international connections. New EDI translation software offerings that are redefining EDI software design are EDI servers/communication gateways, event-driven couplings between translator and application, and the implementation of real-time EDI systems between two companies.

Growth in EDI will occur within and emanate from industries that are already doing EDI or can be considered core economic industries. Transportation, distribution, and auto manufacturing, for instance, are established EDI-using industries that will experience growth both within their trading communities and with industries connected to them. Banking/finance and petrochemicals are budding EDI industries that, because they play such central roles to all other industries, should become EDI-intensive.

Some industry segments offer better EDI opportunity than others. Based upon INPUT's EDI expenditure forecasts, process manufacturing offers the best 12-month growth in anticipated EDI expenditures at 40%, followed closely by the transportation industry (39%) and the distribution industry (38%). These three industry groups will offer an excellent marketing opportunity to suppliers of EDI products and services.

Despite the low marginal value to a company of bringing up its smallest trading partners, some vendors and users are still attempting to migrate all of a company's trading partners to EDI. Inexpensive micro-based translation software, trading partner turnkey implementation services, and conversion services (EDI-to-fax, post, E-mail) are being offered by vendors in an attempt to help companies connect all their trading partners. Whether this is an economically sound strategy remains to be seen.

Diminishing returns are also inherent in broadly implemented hub-and-spoke topologies, and "80-20" implementation practices suggest there may be an upper limit to the number of EDI-using companies in the economy. Time may show that EDI is used just to facilitate the central trade flows between major corporations and agencies. Most industries are dominated by a handful of large companies. These companies, if they choose to adopt EDI, begin by linking with their key trading partners (the 20% responsible for 80% of the business). Since 80% of the U.S. GNP is produced and distributed by 20% of its companies, when the key 20% of the economy's businesses have established comprehensive and effective EDI programs, there may be little marginal value to the economy of adding other trading partners.

C

EDI Issues

The following are the two major issues perceived by users and vendors.

1. Growing the EDI Community

Users and vendors perceive the overall growth of the EDI community as the most significant EDI issue. This concern with or desire to expand the scope and magnitude of EDI activity is stated in a variety of ways. Many

refer to attaining critical mass for EDI. By this they mean that the population of EDI users must grow to a size that provides them with *de facto* business legitimacy. Worldwide, nationwide or industrywide, EDI must become not only an accepted means of transacting business between trading partners—it should become the *preferred* means for such relationships. Most logically, acceptance will move from industry to nation to worldwide, and will be the result of the intensive, focused efforts of large companies that see a significant benefit in EDI and see it as a tool for improving the way they do business.

Vendors and users also agree that technical issues (e.g., technical capabilities or resources) are not the factors currently limiting EDI growth. Rather, it is the business community's slow acceptance of EDI that has restricted growth.

Although EDI supporters wish it were otherwise, the fact is that EDI will probably continue to grow at a slow but steady pace for the next decade. The 21% CAGR in EDI services and software revenues forecast by INPUT for the next five years (through 1996) is predicated on a 1991 base of \$231 million. Although a reasonable number for annual sales for a corporation, that number (for all EDI product-related revenues) is just large enough to place the whole EDI product and services marketplace at the low end of annual sales for those companies responding to INPUT's 1991 EDI user survey. This is not intended to denigrate these revenues, but merely to indicate that the market for EDI products and services is in its infancy, is still small, and that a 21% growth rate on such a base is reasonable, not overly optimistic, and not an indication of rapid growth.

Before significant growth can occur, however, the ripples of EDI trading relationships will have to continue to expand much further than they have so far, and more and more large, industry-driving corporations will have to declare their intent to transact their purchases (and, perhaps, sales) only through EDI interconnects. Such a movement is inevitable—the intrinsic benefits to EDI are simply too important to corporate interests and performance to ignore (or delay) for long.

2. Standards

INPUT considers the following to be the main standards issues:

- The X.12 and EDIFACT standards are a major step in the right direction, without which EDI, as a practical business tool, would not exist. But they do not realistically accommodate existing business practices. Before EDI can achieve more significant growth, practical modifications to the existing standards will be necessary.
- More attention needs to be given to the use of people-related (easy to understand) formats. Ease of use will promote use.

- Interactive EDI will inevitably require formats for real-time activities. Such formats must be incorporated into the standards.
- Redundant and unnecessary data elements must be eliminated. They clutter the data path, slow processing and add to human error.
- Standards bodies move at a glacial pace. Efforts must be undertaken by the stronger members of the standards bodies to move the process ahead at a faster pace, with more attention to the realities of the marketplace, and less concern for complete agreement. If this occurs, the resulting X.12 standards (and modifications) should speed a growing acceptance of EDI in the world marketplace, to the benefit of users and vendors alike.
- Interconnects. There is a continued need for improved inter- and intra-enterprise interconnects. Although not critical to the intrinsic implementation and value of EDI, such interconnects facilitate use and speed implementation, thus aiding in the steady growth of the global EDI function.

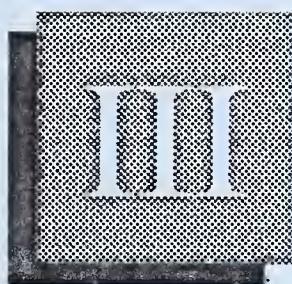
D

Conclusions

The economics of EDI (as well as all information systems technologies) are not yet clearly understood and that lack of understanding is partly responsible for inhibiting the growth of EDI. Such understanding will come only after many years of business experimentation and evolution. EDI reorganizes businesses, industries, and economies. It changes unities within the macro-economic system. Buyers and sellers become more integrated. Industries become integrated as a result of collectively defining standards. Vendors are often users. Users are often vendors. Competitors form consortia.

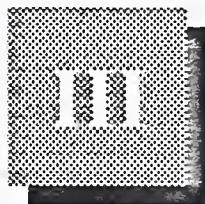
Within a single company, departmental boundaries and job descriptions are redefined, because properly implemented, EDI touches all functional groups of a company—sales, manufacturing, accounting, shipping—and buyers, product designers, production line workers, sales personnel, accountants and all other workers become a single team. What occurs is, in a very real sense, a cultural change. And even though the change is for the better, it *is* a major change, and thus most businesses are slow to react, especially in times of economic turmoil and uncertainty, such as the current recession.

INPUT, however, believes that EDI is here to stay and that growth at a continuing, steady pace is inevitable. The benefits to EDI are just too significant to ignore.



EDI Background

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EDI Background

A

Introduction

Today, in the United States, virtually all large and many smaller companies have installed computerized systems for routine business operations such as order processing, inventory control, accounting, and so on.

A business will use these computer applications to prepare business documents such as purchase orders, invoices, shipment bills of lading, etc. Typically, the documents are printed on paper and mailed to the company's appropriate trading partner. For example, purchase orders are sent to suppliers, invoices to customers, bills of lading to transportation vendors, and payment instructions to the company's bank.

The company's trading partners receive these paper documents and, in most cases, put the data into their respective computer systems. In other words, the data generated in one company's computer system is temporarily transferred to paper so that it can be re-entered into another company's computer. In fact, a study by General Electric found that 70% of all data entered into computers is generated by other computers.

Electronic data interchange (EDI) was invented to obviate the need for paper data transfer methods, and their associated high labor-intensiveness and cost.

The rationale of EDI is to allow the direct computer-application-to-computer-application exchange of data representing business documents. This exchange is sometimes handled by physically shipping computer tapes or diskettes. But increasingly, data networks are being used.

B

The Role of Standards

Rarely do two businesses have computer applications that identically format the data of their business documents. Furthermore, different computer systems (with different brands of hardware, software, telecommunications protocols, etc.) prevent applications from being connected and smoothly communicating with each other.

Thus, to allow computer systems to directly tie into each other, the data formats that represent the business documents must be standardized. Each organization is then free to build its particular applications to a common standard. The data is machine processable by any other application that has been built to the standard. Exhibit III-1 gives the technical definition of EDI.

EXHIBIT III-1

Definition of EDI

EDI is the application-to-application exchange of intercompany business data in structured, standard data formats

Despite the availability of public standards, however, there is much EDI activity that is conducted using proprietary data formats. Usually, a dominant company requires that its dependent suppliers accept the data formats of its system(s), with the penalty to the supplier being the potential loss of business if it doesn't comply.

C

Benefits of Using EDI

Companies using EDI benefit from improved use of labor, inventories, capital (funds) and facilities.

Specific benefits are listed in Exhibit III-2.

EXHIBIT III-2

Benefits of EDI

- **Data Keying**—EDI reduces or eliminates redundant data entry.
- **Errors**—EDI eliminates keying errors; eliminates human interpretation/classification errors; and eliminates filing errors and lost documents.
- **Filing**—EDI replaces paper document filing with electronic files. It eliminates the need for human filing and file retrieval and reduces total space for computer files.
- **Paper Forms**—EDI reduces paper forms, especially multipart carbons going to many departments.
- **Postage**—EDI replaces mailed documents with data transmissions.
- **Invoicing**—EDI eliminates the need to invoice, since payment can be automatically triggered upon receipt of goods (evaluated receipt settlement).
- **Payment**—EDI replaces checks with electronic payment.
- **Accounts Receivable**—EDI automates the cash application function, improves control, and eliminates the billing/invoicing function via evaluated receipt settlement.
- **Accounts Payable**—EDI automates the entire payments process, including payment and remittance creation; it eliminates invoice validation via evaluated receipt settlement.
- **Inventory**—EDI reduces order lead time and order confirmation delay; it facilitates just-in-time inventory and the maintenance of lower levels of costly inventory. It reduces out-of-stock situations and allows better control overall.
- **Customer Service**—EDI allows for more responsiveness to customers and direct sales connections, and encourages lasting relationships with customers.

D

EDI and Other Data Communications Applications

For the purposes of market definition, analysis and discussion, EDI should not be confused with other closely related data communication applications. These include:

On-line Systems

On-line systems such as computer reservation systems (CRS) and customer order-entry systems are not considered EDI. These systems adhere to a terminal-host architecture, not the host-host architecture mandatory for the application to be considered EDI.

Electronic Funds Transfer

Buying and selling relationships involve inquiring, ordering, bidding, shipping, and other similar activities. The process culminates in a monetary exchange. EDI is typically associated with the transfer of information regarding the first set of functions, while EFT is the transfer of monetary value.

Financial institutions have developed structured, computer processable data formats by which they can transfer value amongst themselves and on behalf of their customers. Since these formats were developed within the banking industry (and under the control of the Federal Reserve), EFT is not considered an entirely EDI application.

In particular, data exchanges involved in automated teller machine, point-of-sale, and many kinds of interbank transfers (such as those for foreign exchange trades, cash considerations or direct deposit of payroll) are considered to be outside the definition of EDI. Only those funds/data transfers that are specifically linked to a corporate-to-corporate business transaction are considered within the scope of EDI. Often, industry insiders call the funds transfer side of EDI "EDI/EFT" or "financial EDI."

Electronic Mail

Electronic mail contains text that is freely formatted/structured and therefore not machine processable. Although allied to EDI, E-mail is not considered EDI and will not be analyzed in this report. However, it will appear as a topic in Chapter V, EDI Market Trends and Issues.

E

The Role of Value-Added Networks

Using today's standard (voice) telephone lines, the computer systems of a company can directly "dial up" another company's computers to exchange EDI messages. Indeed, many large companies maintain their own substantial internal data communications networks and frequently allow outside companies to access these resources. Today, some EDI is done in this manner, e.g., directly between companies. However, this approach is not practical for the majority of companies that are using (or could potentially use) EDI. Reasons for this limitation include:

- The computers, communications protocols to connect them, and the data formats between sending and receiving computers may be incompatible.
- Business relationships are numerous and complex, especially for large companies. Each EDI trading partner may have unique data formatting, protocol, scheduling, and other requirements. Managing the multitude of specific requirements quickly becomes a non-trivial task requiring people and computing resources when many (approximately twenty or more) EDI trading partners come on-line.
- Direct links require expensive hardware at the host company. Mandatory capabilities include multiple telecommunications ports, 24-hour operation capability, fault-tolerant architecture, network management capabilities, mailbox capabilities, the ability to handle a variety of protocols and line speeds, and security features.

Because of these requirements, the need arises for a third party, such as a value-added network (VAN) or a remote computer service bureau (RCS) to act as an intermediary between companies that trade electronically.

In addition to resolving the noted shortcomings of direct telecommunications between companies, third-party VANs provide other services to EDI using companies. Exhibit III-3 lists the benefits of using a third-party VAN or RCS.

Today, networking for EDI transmissions is provided in three broad categories:

- Directly between two companies using standard telephone lines
- Via a third-party VAN/RCS store-and-forward switch
- Via an industry association clearinghouse, which is similar to a VAN/RCS. Transnet (automotive parts), IVANS (insurance) and Specification 2000 (aircraft parts and services) are examples of this approach.

EXHIBIT III-3

Benefits of a Third-Party VAN/RCS

- Store-and-forward mailboxing, to accommodate differing schedules of trading companies
- Systems integration/connectivity, to allow different computer systems to communicate with each other
- Aid in bringing up new EDI trading partners
- Better reliability and large resources are more readily available
- Security
- Tracking and control reporting
- Network management
- Easy access to many potential trading partners
- Data format conversion and translation

F**The Role of Software**

Essential to EDI is the translation of company data formats into standard formats or into the proprietary formats of a leading trading partner.

Users subscribing to VAN or RCS services may rely on software hosted on the vendor's processors to perform data format translations. Alternatively, users may conduct this translation function on their own premises using in-house translation software. This approach is less expensive over time and is the dominant trend.

Users can either write their own software or they can purchase it.

- If purchased, customization and interfacing to internal applications by the software vendor, a professional services vendor, a consultant, or the user's own development staff is usually required.
- EDI software should be closely linked ("mapped") to existing applications to optimize its usefulness. Otherwise, a company may have to print the received EDI transactions (to understand what has been transmitted) and rekey the data, thus losing efficiency.

G**User Trends in Adopting EDI****1. Reasons for Implementing**

Typically, it is the large Fortune 1000 and Forbes 500 companies that consider EDI a strategic technology and deliberately incorporate it into long-range plans. Smaller companies do not necessarily view EDI as strategic, and frequently implement it only because their largest customers have requested that they do so. In a 1991 INPUT survey, the respondents indicated that 40% had implemented EDI because their customers had required or requested it. Thirty-eight percent stated that they had asked their suppliers for EDI. Primary reasons for implementing EDI are summarized in Exhibit III-4.

EXHIBIT III-4**Primary Reasons for Implementing EDI**

Reason	Percent
Company's customers required it	40
Company asked suppliers	38
Company asked customers	5
Supplier asked customers	2
Other	15

2. The “Hub and Spoke” Phenomenon

Because most users adopt EDI at the request of a large trading partner, a “hub and spoke” pattern has emerged. A single large company—the hub—has electronic ties with several suppliers and trading partners—the spokes. EDI typically grows along the lines of these hub and spoke clusters.

3. Customer Premise Data Format Translation

Since the mid-1980s, users have increasingly opted to perform data format translation on their own hardware platforms with purchased or developed software, and not use the translation function of the VANs. An explosive increase in the number of third-party software vendors (there are now more than 40) since 1985 has led to a large selection of translation software. Packages are available not only for mainframes, but also for micros

and midrange computers. Prices range from \$600 to \$20,000 for the non-mainframe packages, and \$15,000 to more than \$120,000 for mainframe versions. Thus, there are multiple points of entry for the novice EDI company.

4. User Platforms

In the hub and spoke environment, the large hub company usually implements a mainframe translation software package. Its trading partner spoke companies usually implement micro or midrange packages. Sometimes, however, a large company will use a smaller platform than a mainframe—often a micro—to perform all communications with the VAN and all data translation. The smaller platform is connected to the company's mainframe(s) where the applications reside. Such a configuration (called a "front end") also provides a high level of security by preventing outside telecommunications from directly interfacing with the company's central processor(s).

5. Use of Networks

Method - INPUT's research shows that the majority (67%) of EDI users are accessing third-party networks. Very few (approximately 8%) communicate directly with trading partners using only ordinary telephone lines. However, almost 30% use both direct and third-party services, and this mixed group is expected to grow in proportion to the others.

Dual Sourcing - INPUT's research also shows that one-quarter of all users access more than one third-party network. Multiple networks are used to reach the greatest number of trading partners.

Internetworking Services - The main EDI networks today are interconnected and will transfer a customer's EDI messages to other networks for delivery. Nearly all EDI users are invoking this service.

6. Relationships with Trading Partners

EDI is often implemented along with just-in-time (manufacturing) or quick-response (retail) inventory programs. JIT and QR are inventory management concepts designed to minimize inventory levels. Only enough vendor products are ordered to meet the demands of production or customer sales.

In addition to minimizing on-hand inventories, JIT and QR programs often minimize the total number of suppliers with which a company does business. Companies seek only those suppliers who meet delivery dates and quality levels. Thus, EDI is often conducted among companies that have formed a very close business relationship.

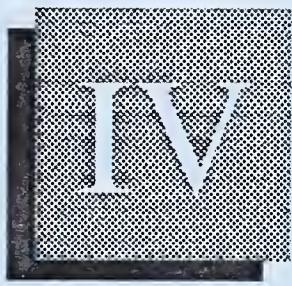
7. EDI Use Grows in Two Dimensions

Typically, a pilot EDI program starts with a single transaction set (for example, a purchase order), with a single trading partner. After the pilot—which may take anywhere from one week to three months—more trading partners are brought in using the same transaction set. Once a certain volume of trade is conducted in a single transaction set, a new transaction set is introduced and the process is repeated. First, the number of trading partners increases, then the number of transaction sets.

8. Parallel Paper and Electronic Systems

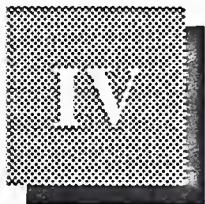
No company, to date, transacts *all* of its business in the EDI environment. Even sophisticated companies use EDI only in small proportion to its potential. Typically, a company only sends EDI purchase orders to a handful of key suppliers. INPUT's survey of large Fortune 500 corporations (companies with more than \$1 billion in revenues) found that the average number of EDI relationships was 432—despite these large companies having thousands of trading partners.

Most EDI-using companies have discovered an “80-20” rule when implementing EDI. The top 20% of their trading partners are typically responsible for 80% of their business. Therefore, a company will target these key partners to start an EDI program. For the remaining 80% of their trading partners (with whom the company transacts only 20% of its business), traditional paper documents are used. Thus, all companies conducting EDI today still have two parallel systems: EDI and paper.



Market Size and Forecast

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Market Size and Forecast

A

Introduction

This chapter presents quantitative data on the market for EDI software, network services, and professional services.

The market is estimated in terms of numbers of EDI-using companies and expenditures on EDI products and services by these companies.

B

Challenges of Measuring the EDI Market

The following are some of the challenges faced in trying to estimate the EDI market:

- Not everyone uses the same definition of EDI.
- Most interviewees at a user or vendor company will be unable to answer all questions relevant to a market research study.
- Double counting. One cannot add up all trading partners of every EDI user (or all the customers of every network) to find the total number of EDI users. Many of one company's EDI trading partners are also the EDI trading partners of another company.

1. Counting the EDI Marketplace

Exhibit IV-1 lists the possible variables that would characterize EDI usage:

EXHIBIT IV-1

Statistical Quantities that Characterize EDI Usage

- Number of companies using EDI
- Number of locations using EDI (some companies have more than one location using EDI)
- Number of EDI mailboxes on networks
- Number of invoicable EDI customers on networks (some companies' EDI network fees are paid for by a trading partner)
- Number of EDI transaction sets sent
- Number of EDI digital characters sent
- Dollar volume of trade for which EDI is responsible
- Percentage of total communication transactions (phone, mail, facsimile, E-mail, telex) for which EDI is responsible
- Number of EDI trading relationships (explained below)
- Total user expenditures on EDI services and products
- Total vendor revenues from EDI services and products

This report focuses on the number of companies using EDI, the number of trading relationships, the total expenditures of users, and the total revenues of vendors.

2. Users versus Trading Relationships

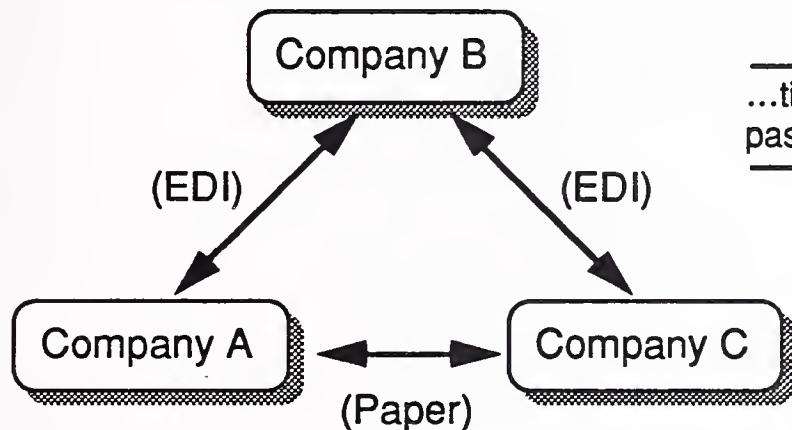
An important distinction in estimating EDI usage is that between total EDI users and total EDI trading relationships.

Exhibit IV-2 illustrates the difference between users and relationships.

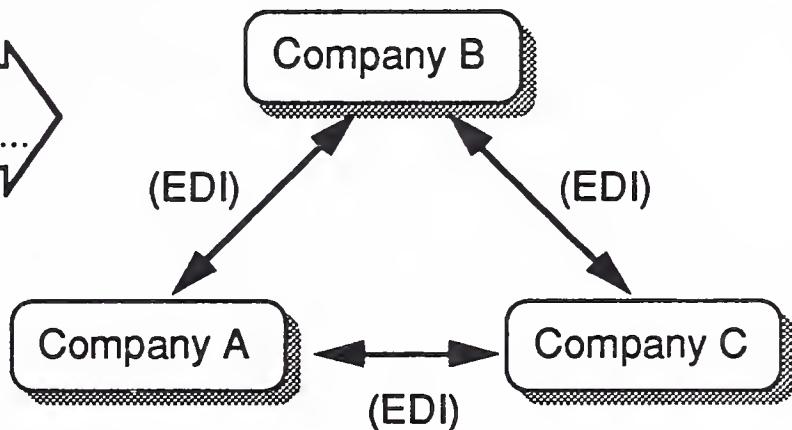
EXHIBIT IV-2

Difference Between EDI Users and EDI Trade Relationships

Three EDI users; two EDI relationships



Three EDI users; three EDI relationships



Counting users → no apparent growth

Counting relationships → growth

EDI usage can grow without an increase in the number of users. The growth comes from existing users establishing new EDI trading relationships among themselves and/or existing users expanding their use of EDI with existing trading partners (introducing new transaction sets, increasing the volume of use of existing transaction sets, etc.).

The relationship between number of users and number of trading partners is shown in Exhibit IV-3.

The formula states that each new EDI user that joins the total user population adds to the existing number of potential trading relationships by its numeric ranking minus one. In other words, if it is the 75th EDI user, it brings 74 more potential trading relationships to the existing number of relationships.

Exhibit IV-4 graphically depicts the relationship between users and EDI trading relationships.

EXHIBIT IV-3

Relationship Between Total EDI User Population and Potential EDI Trading Relationships

$$\sum_{i=1, n-1} n - 1 = i$$

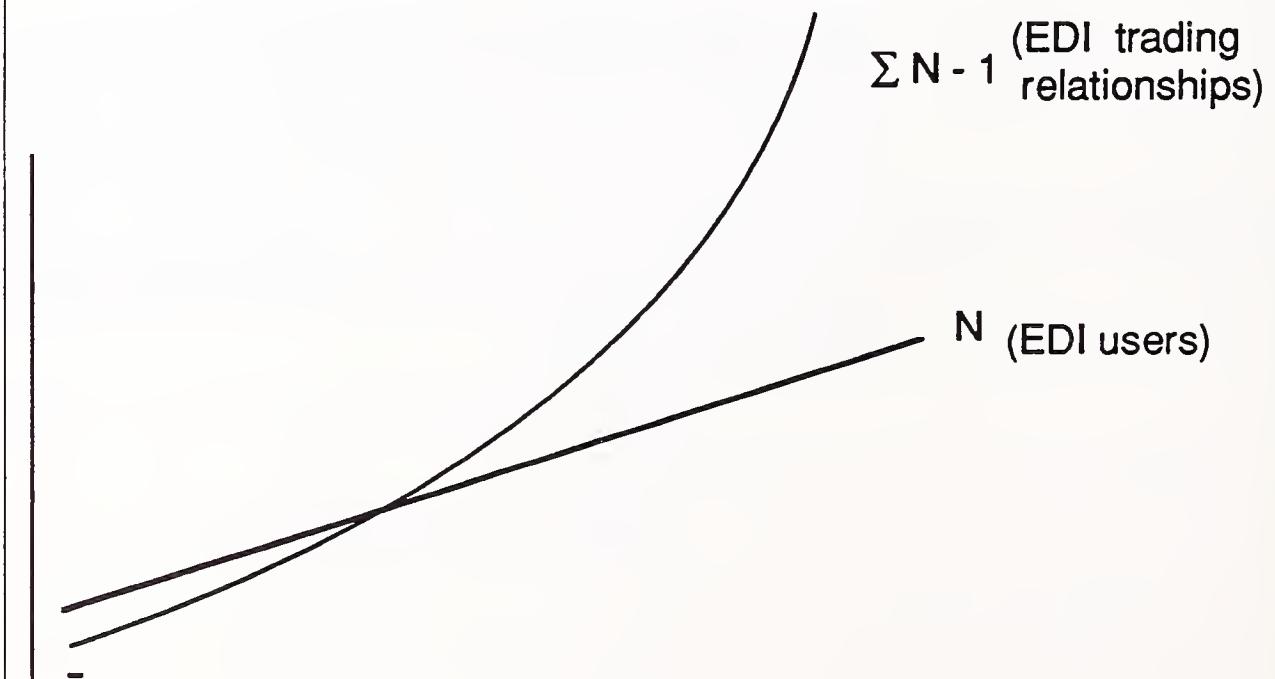
n = total number of EDI-using companies

i = total number of EDI trading relationships

n	$n - 1$	$\sum n - 1$
2	1	1
3	2	3
4	3	6
5	4	10
.	.	.
.	.	.
.	.	.

EXHIBIT IV-4

EDI Users versus EDI Trading Relationships



The implications of this relationship differ for the EDI software vendor and the network services provider.

Even when the growth in absolute number of EDI users slows down or ceases, service vendors will still enjoy growth in their business while software vendors will experience a maturing market.

- Software vendors will be threatened when the growth of EDI adoption slows down. Their market is driven by new companies adopting EDI and by product turnover (companies changing software brands or upgrading).
- Network vendors, however, can continue expanding their markets even when the total number of EDI users stabilizes. The market for network services is driven by new companies adopting EDI, new relationships between companies being established, growth in transmission volumes, and new network services.

INPUT expects the growth in absolute number of EDI-using companies to eventually level off. When this will happen is still unclear. A macro 80-20 rule may govern EDI proliferation in the economy—only the 20% of all companies and/or trading relationships that are responsible for 80% of the GNP will employ EDI.

C

Assumptions of the Forecast Model

The U.S. EDI market has been examined as the sum of its components as follows:

- Network services, including access point maintenance, error correction, protocol speed conversions, switching, store-and-forward services, internetworking through gateways, format compliance checking, format translations/conversions, and other processing services. These services are typically offered by third-party service providers' networks, although private networks may deliver many of these elements. This market forecast estimates only third-party network services.
- Software that resides at user premises that translates data between EDI standard formats and formats of the company's internal software applications.
- Professional services for systems design, software customization, equipment selection and acquisition, systems integration, facilities management, education and training.

The following are specific assumptions for each delivery mode.

1. Network Services

Revenue figures were obtained from direct interviews and reports, from network providers, and from estimates based upon the specific network's customer base. The customer base data was obtained from interviews of service providers, collateral documentation, and common-sense guessing. The customer base is defined as the number of discrete companies using the network (*not* mailboxes on the network or invoiceable accounts).

The data from user surveys and interviews showed that companies in the top 1% of EDI network usage as measured by expenditures on network services (typically users with 20 or more trading partners) paid an average of \$60,000 per year in network charges. (After examining the data, INPUT determined that 20 trading partners was the threshold that separated the steady, large EDI user from the experimental/beginning small user.)

After discussions with network providers, INPUT estimated that 85% of the networks' EDI customers are spoke-type companies that pay a minimal amount per year in network charges.

Thus, INPUT, in building a model for revenues of network service providers, assumes that 85% of a network's customers pay, on average, \$2,000 annually, 14% pay \$11,000 annually, and 1% pay \$60,000 annually. This formula was applied to the customer base of each EDI network, unless specific data for a given provider was more accurately known from a source other than the model—most typically, verbal interviews.

Exhibit IV-5 shows the distribution of customer revenues per percentile for EDI network providers.

EXHIBIT IV-5

Distribution of Customer Revenues by Percentile for EDI Network Services

Customer Base Percentile	Average Network Revenue
85	\$2,000
14	\$11,000
1	\$60,000

Customer base as of year-end 1991

These assumptions can be applied to all U.S. EDI service providers, but, of course, each network will have its own specific model. The noted assumptions are considered to be average. INPUT speculates that if the model errs, it errs on the low side—that is, it underestimates the network market.

EDI service providers derive some revenue from professional services and software. INPUT omitted these revenue components from stated revenue estimates wherever possible.

2. Software

As with the network services estimates, software revenue estimates are derived from installations, unless more specific data has been provided from another source. Revenues for 1991 are the product of the number of installations made in 1991 and the average price of the software/installation plus revenues from maintenance fees on the existing customer base. INPUT assumes that 2/3 of a software vendor's revenues come from new-installation sales, and 1/3 from maintenance fees.

1991 installations, in general, have remained at the same rate as 1990, but revenues are up 15% over 1990. The installed base has increased 32% over 1990, and related maintenance revenue now represents 1/3 of total revenues, up from 20% in 1990. Maintenance fees have not significantly increased, but the steady rate of installations, coupled with few, if any, price increases, has simply resulted in base maintenance fees becoming a larger portion of vendor revenues.

The software component of EDI earnings includes revenues derived only from EDI translation software. Applications software that has built-in EDI capabilities is not considered in this market estimate.

3. Professional Services

This category includes the professional services provided by software vendors and network service providers as well as independent professional service firms, based on the total number of companies and consultants that offer professional services. INPUT estimates that there are approximately 35 to 40 individual consultants (including consultants belonging to the Big Six accounting firms) and another 10 companies (such as IBM, Sterling Software, GEIS, and Harbinger) that provide consulting in addition to software and/or network services.

For the individual consultants, INPUT assumes that the average yearly gross on EDI professional service consulting is \$500,000. For the larger/multi-offering companies, INPUT assumes their average gross for professional EDI services is \$1.5 million.

D**Data Presentation****1. Leading Vendors**

Exhibits IV-6 and IV-7 provide INPUT's customer and revenue estimates for the leading network services and software vendors to the EDI marketplace.

EXHIBIT IV-6

**Leading EDI VANs
1991**

Company	Estimated 1990-1991 Customers	Estimated 1991 EDI Revenues (\$ M)
GEIS	6,500	37.0
Sterling	4,000	30.0
IBM Information Network	2,000	20.0
Railinc	770	14.0
Kleinschmidt	900	10.0
Harbinger	2,500	8.0
BT North America	1,500	7.0
Transnet	4,400	6.8
Sears	1,400	4.7
TranSettlements	750	2.6
Telecom Canada	650	2.2
AIR Inc.	250	0.9
U.S. Sprint	125	0.5
AT&T	150	0.5
MCI	80	0.3
Other	600	3.5
Total	26,575	148.0

EXHIBIT IV-7

Leading EDI Software Vendors 1991

Platform	Company	Estimated 1991 Customers	Estimated 1991 Revenues (\$ M)
Micro	Supply Tech	7,000	8.5
	TSI/Foretell	2,000	4.0
	GEIS	3,000	2.25
	EDI INC	1,500	2.0
	Harbinger	2,200	2.0
	Sterling	1,000	1.5
	IBM	900	1.0
	EDS Canada	750	1.0
	APL Group	1,150	1.0
	American Business Corp.	1,250	0.8
	RMS	900	0.5
	DNS	700	0.5
	Piedmont	350	0.5
	Unisys	35	0.5
	Other	1,600	N/A
Total		24,335	26.0
Mid- range	Premenos	1,400	3.5
	Sterling	500	3.4
	IBM	350	1.7
	Other	100	N/A
	Total	2,350	8.6
Main- frame	Sterling	400	4.75
	IBM	200	3.5
	DEC	200	2.5
	GEIS	300	1.5
	EDI Solutions	190	1.0
	TSI International	190	0.5
	Supply Tech	N/A	N/A
	Other	205	N/A
	Total	1,685	14.0

2. Market Sizes and Forecasts

Exhibits IV-8, IV-9, and IV-10 show forecasts through 1996 for the EDI services and software markets.

EXHIBIT IV-8

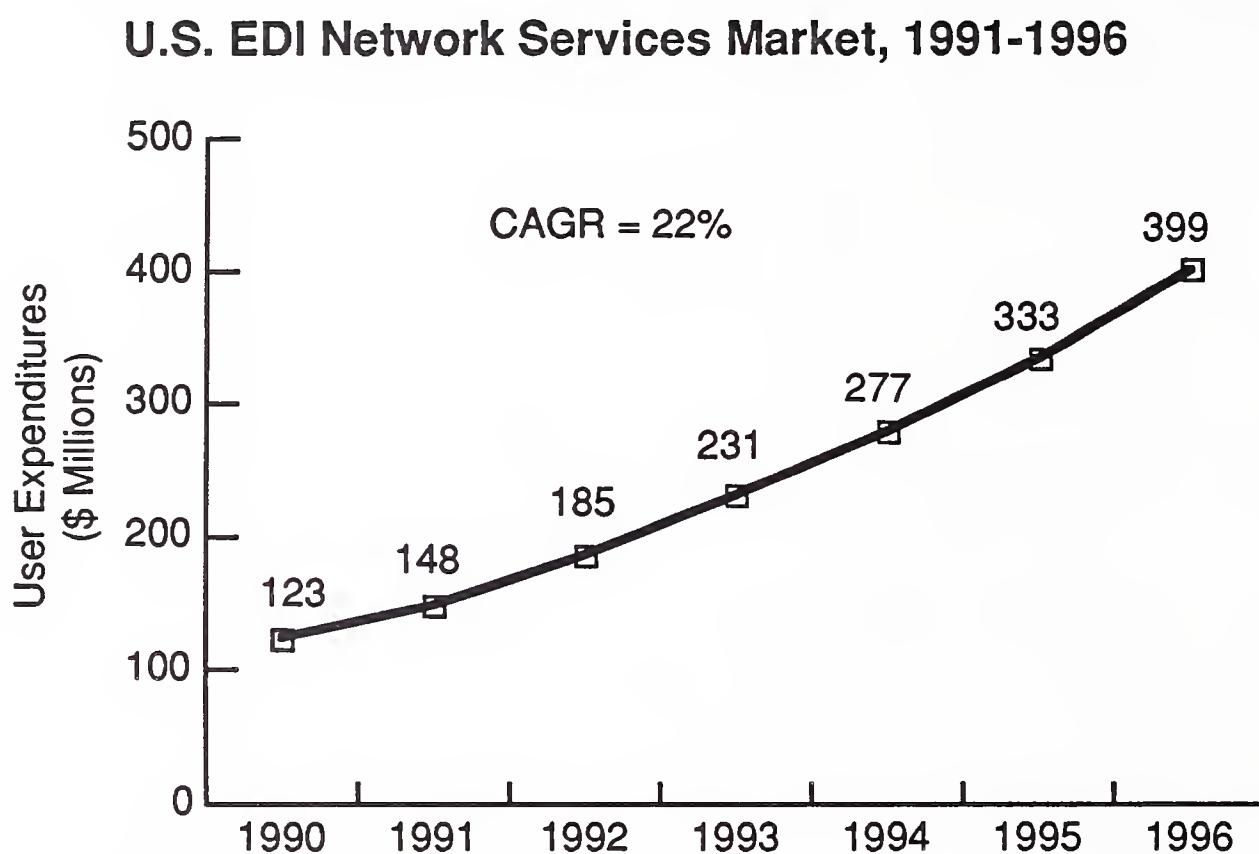


EXHIBIT IV-9

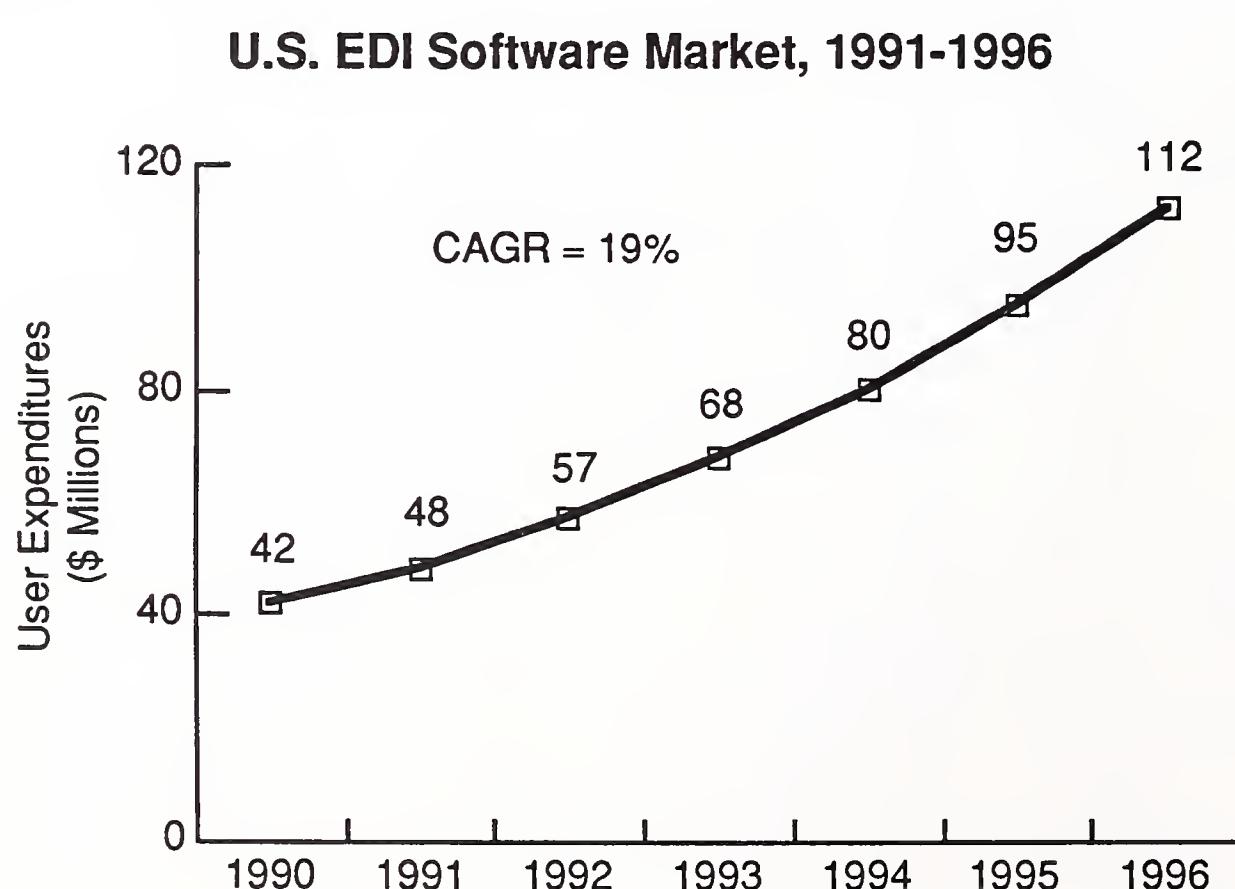


EXHIBIT IV-10

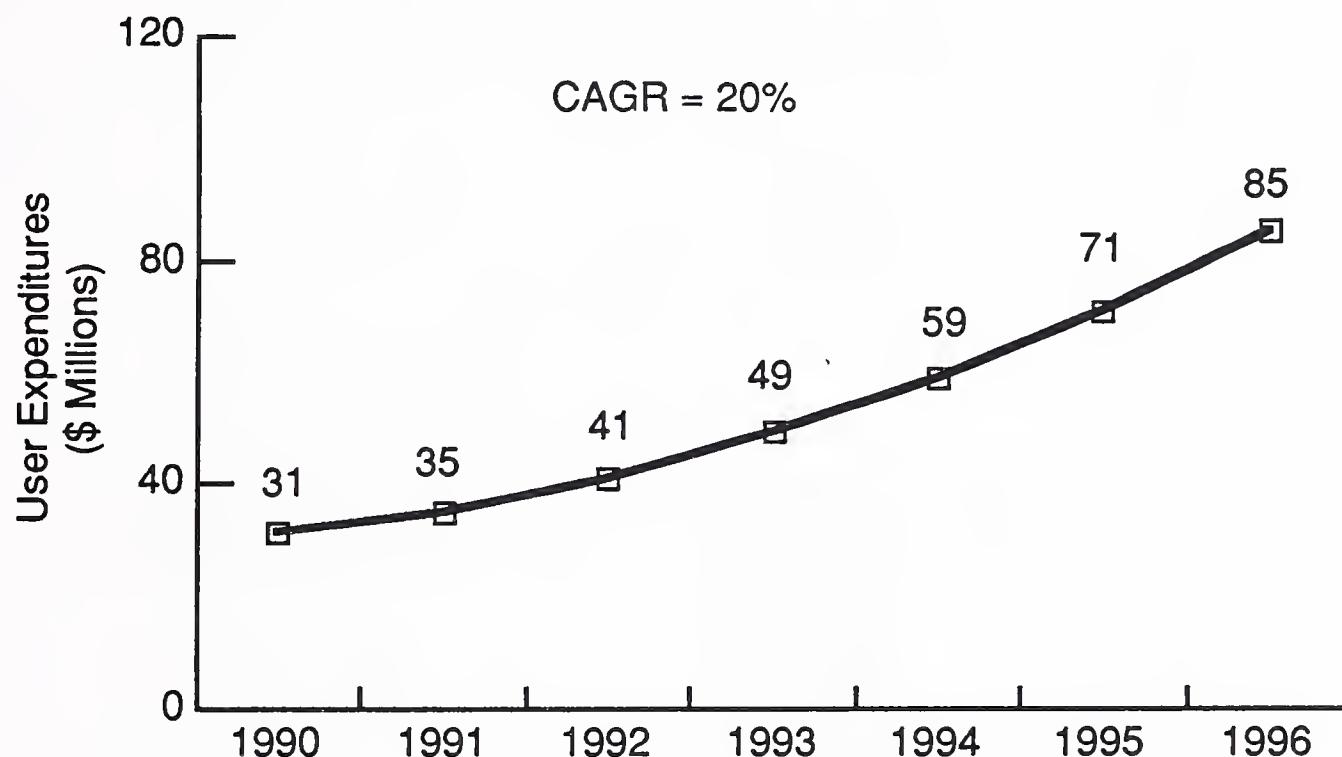
U.S. EDI Professional Services Market, 1991-1996

Exhibit IV-11 offers the growth forecast for the total U.S. market for EDI services and software.

EXHIBIT IV-11

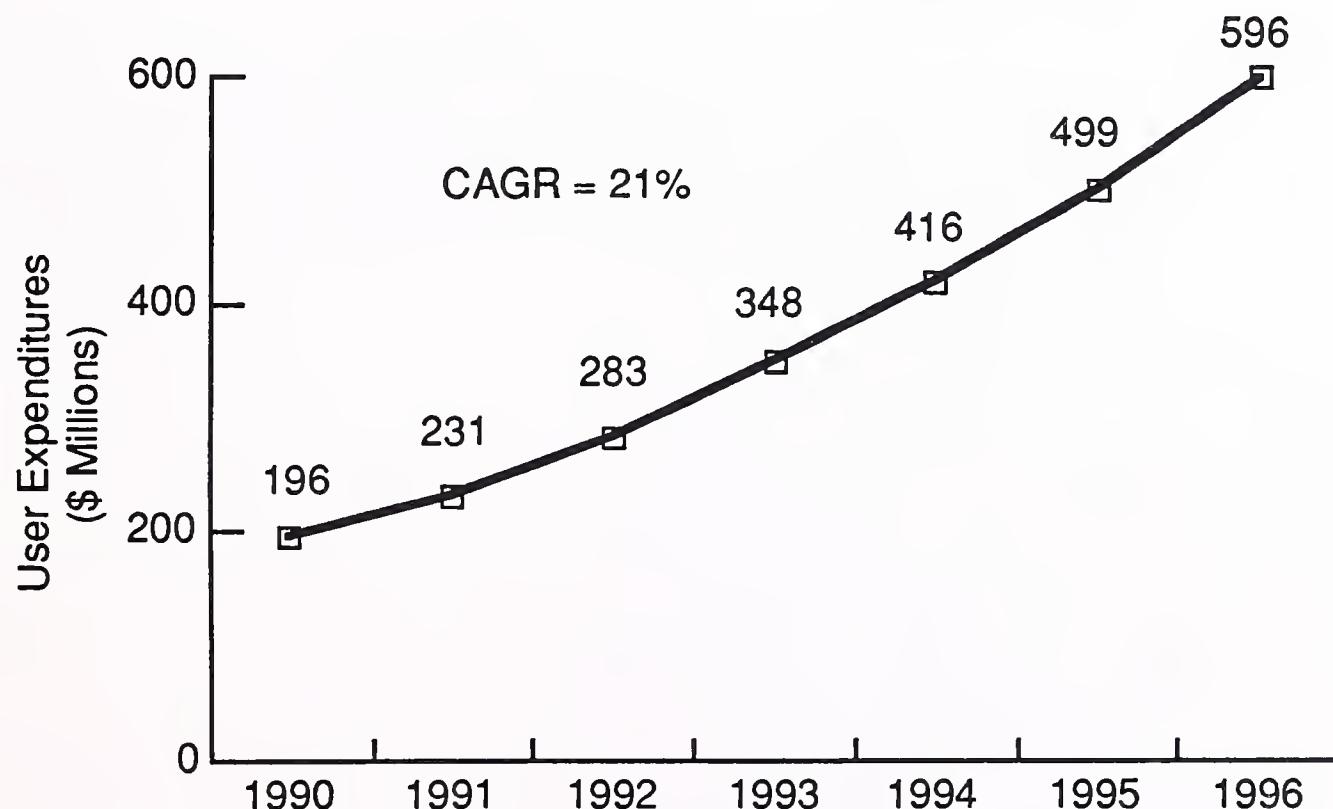
U.S. EDI Services and Software Market, 1991-1996

Exhibit IV-12 graphically represents the magnitude of change in the three delivery modes—software, network services, and professional services.

EXHIBIT IV-12

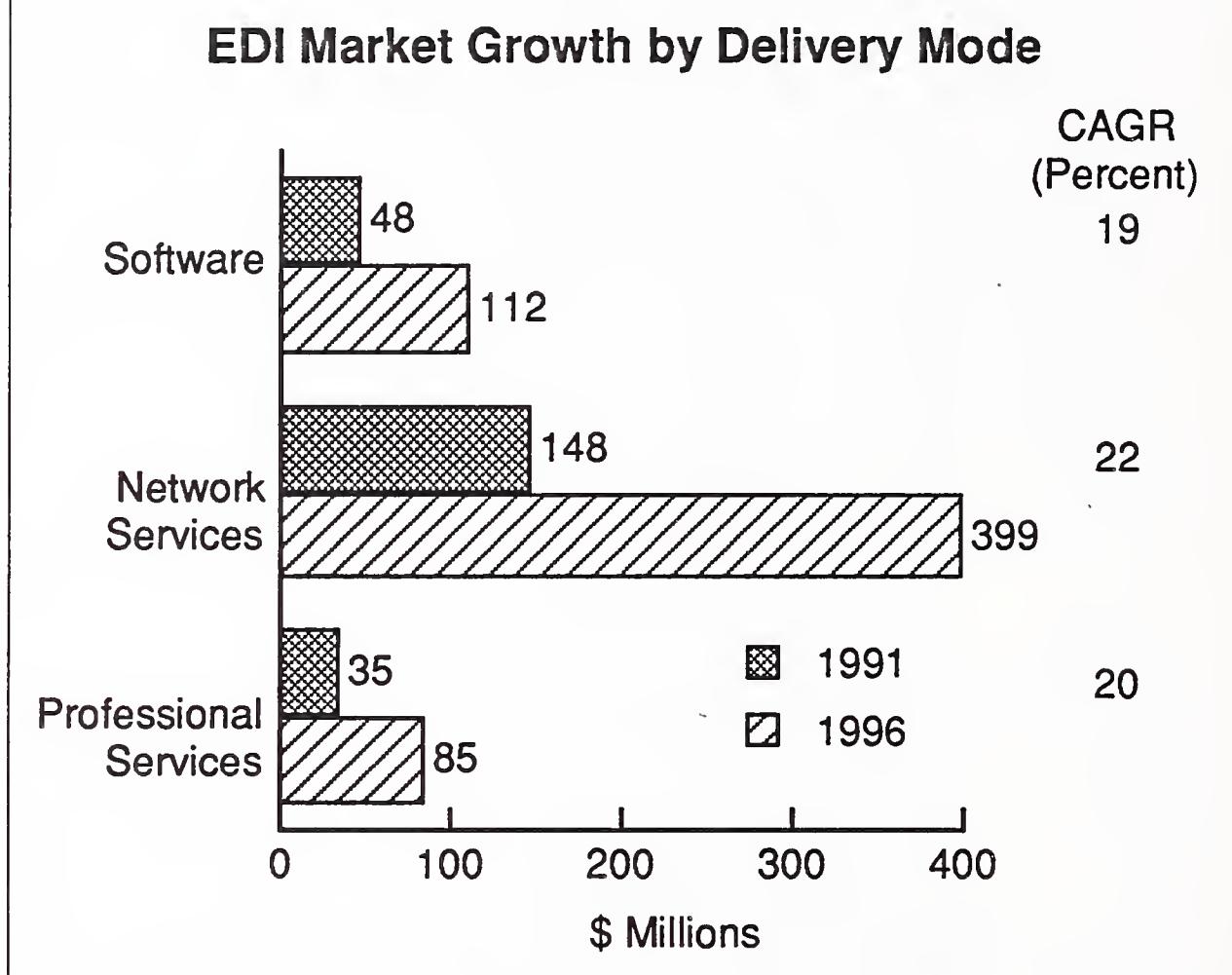


Exhibit IV-13 combines the individual values for software, networks and professional services into a single number showing total EDI revenues for 1991 and 1996.

Exhibits IV-14 and IV-15 show the market shares of leading EDI VAN and software vendors. For software vendors, the value used was the combined revenues from all software platforms (micro, midrange and mainframe). VANs with less than a 6% market share and software vendors with less than a 7% share are included in the “Other” category on both charts.

EXHIBIT IV-13

The U.S. EDI Services and Software Market 1991-1996

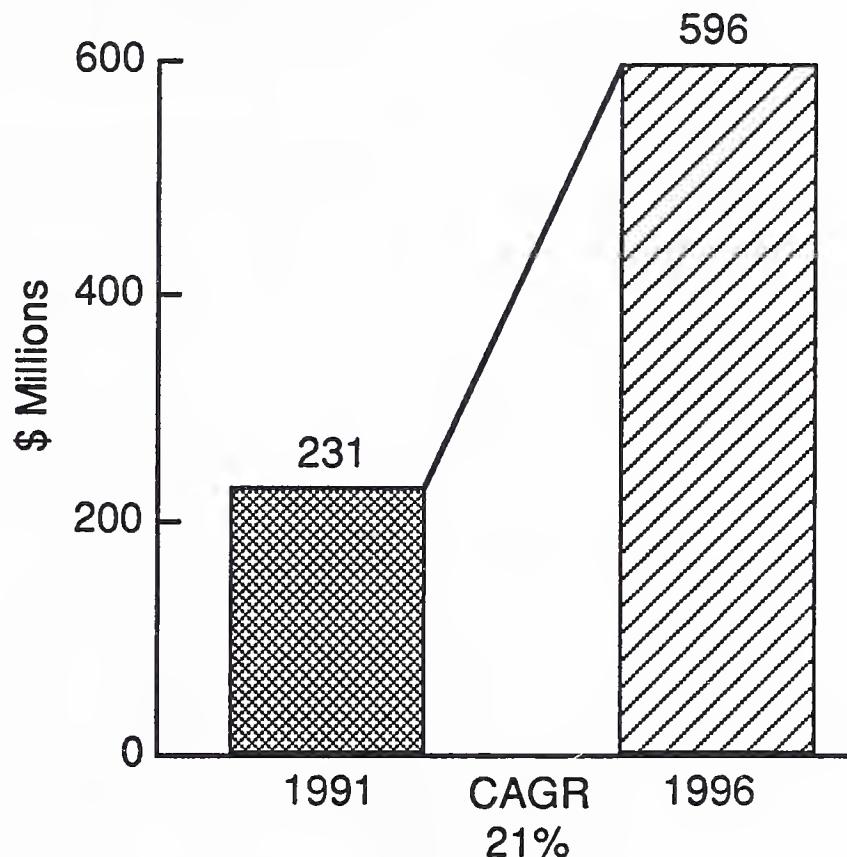
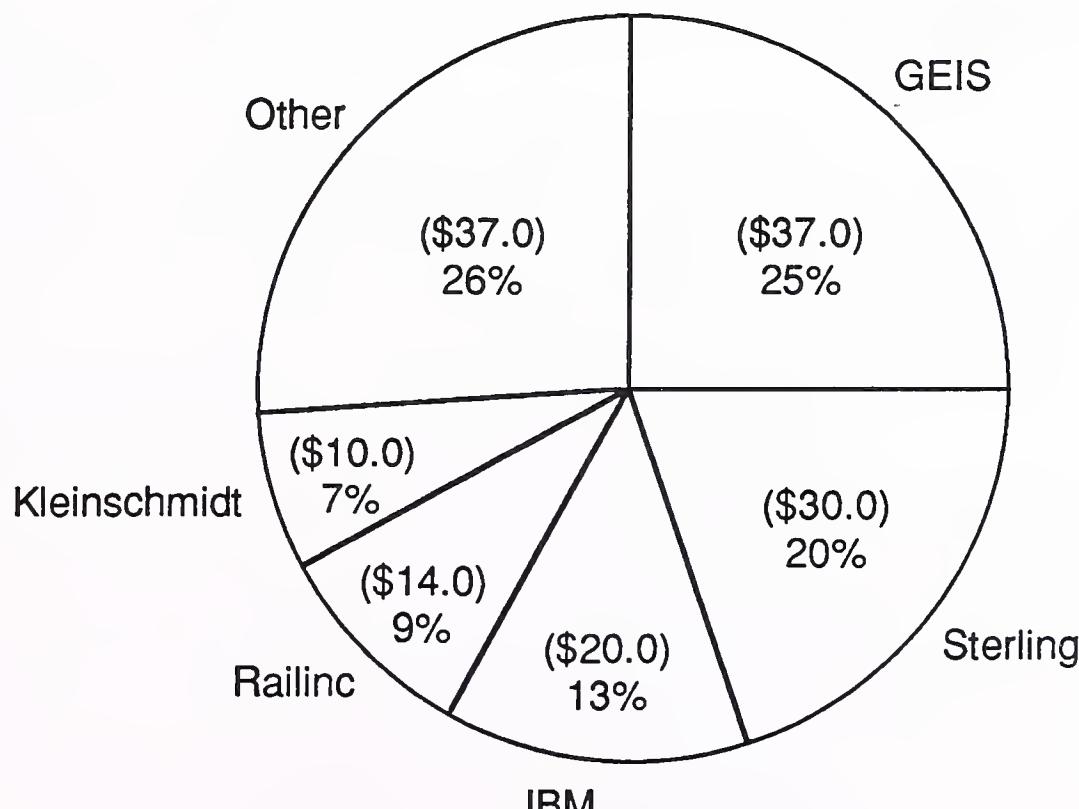


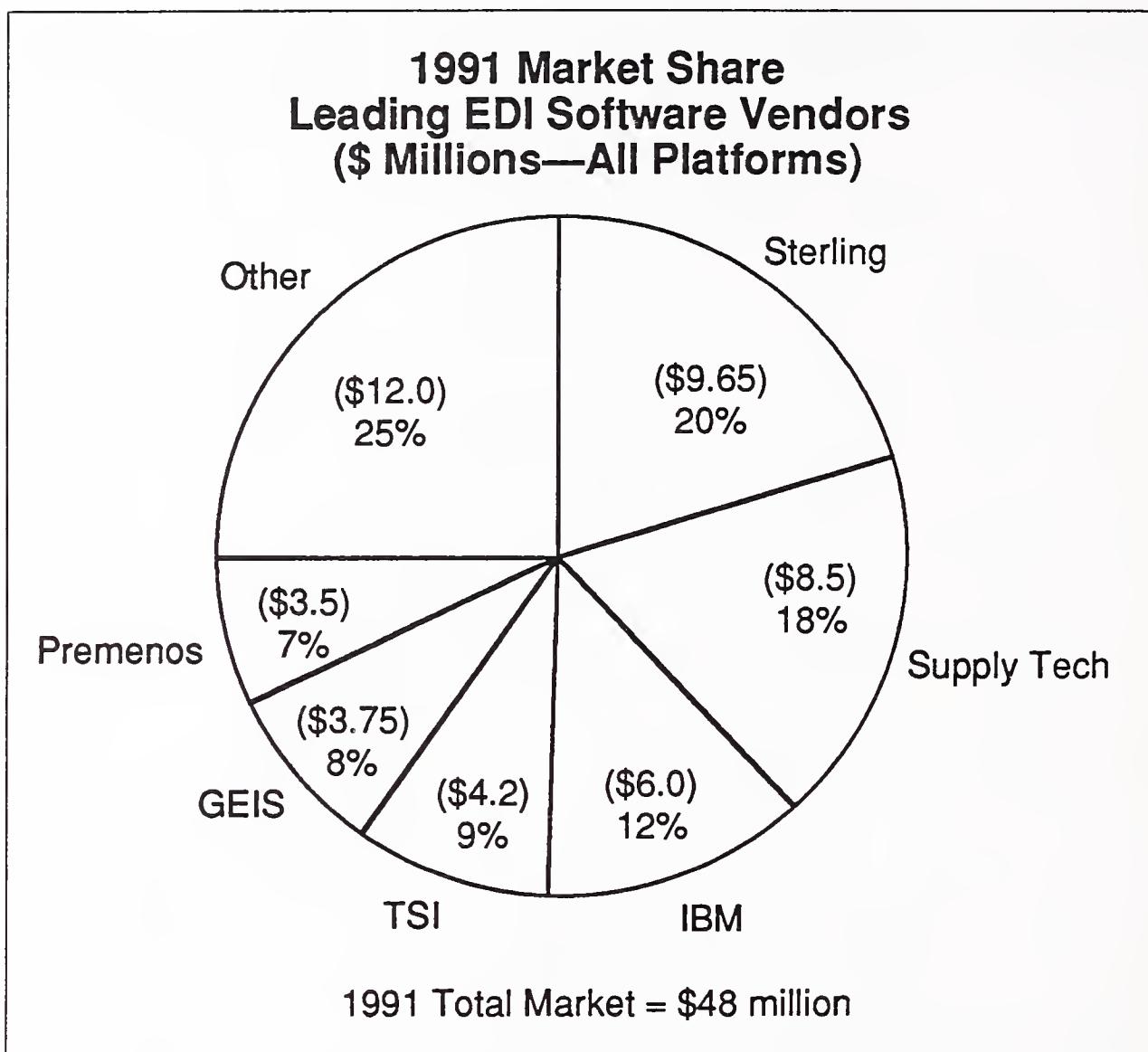
EXHIBIT IV-14

1991 Market Share—Leading EDI VANs (\$ Millions)



1991 Total market = \$148 million

EXHIBIT IV-15



E

Discussion of Forecast

Independent interviews with network service providers and EDI users confirm that the total number of EDI trading relationships should increase from the fourth quarter of 1990 to the fourth quarter of 1991 by approximately 10,000.

The absolute increase in new EDI users is somewhat less than the increase in relationships and is best approximated by the incremental growth in software installations. INPUT estimates the increase of new EDI users to be approximately 6,800, or 32% over 1990.

The total number of network customers at the end of 1991, approximately 26,500, should not be equated with the absolute number of EDI users. There is a significant portion of double-counted users in this figure because, according to INPUT's user survey, one in four companies uses more than one network. The figure therefore is higher than the actual U.S. EDI user population. INPUT estimates that there will be approximately 20,000 EDI users in the U.S. by the end of 1991.

While INPUT estimates that the market for EDI services and software is currently growing at a compound annual growth rate of 21%, 1991-1996 revenue growth for suppliers to the EDI market will be less than the two-and-a-half times growth in absolute size (from 1991 to 1996). As noted in the previous charts, the market for EDI services and software should reach \$596 million by 1996, up from the 1991 size of \$231 million.

INPUT projects that a leveling off will occur in the EDI market. Various phenomena suggest this leveling:

- According to user research, network charges level off despite the addition of new EDI trading partners. Often the new trading partners account for a marginal (very small) volume of EDI transmissions. Also, as users optimize their systems, they send less data (per commercial transaction) to each other.
- A “macro” eighty-twenty rule may apply to the economy—80% of the GNP is produced and distributed by 20% of the companies. (Actually, the distribution is much more skewed: of the \$5.55 trillion GNP of 1990, the Forbes 500 accounted for \$3.5 trillion (64%) and the Fortune 500 accounted for \$2.3 trillion (42%).) In addition, when all key producers in the economy are “up and running” in an EDI environment, the marginal value of bringing on more users becomes almost nil.

When this leveling off will occur is hard to predict. Furthermore, the leveling off effect may be postponed as the world economy becomes ever more integrated. Integration tends to trigger an increase in demand for electronic interorganizational systems—a phenomenon now embodied in the new EDI concept of *Electronic Commerce*. INPUT is closely monitoring the new electronic commerce marketplace and its many players, and will continue to issue reports and papers regarding this major new force in the EDI marketplace.

INPUT estimates that the market for EDI software is more mature than the market for network and professional services. This conviction is graphically supported by the data in Exhibits IV-8 and IV-9. The maturity is due to the fact that the total universe of potential EDI-using companies is much smaller than the potential number of trading relationships among these companies.

Once a company begins using EDI, it has already made its main software expenditure, but it usually increases its network usage year by year. The maturing of the software market will be more pronounced in the mainframe/midrange markets than in the micro markets. The latter, however, contain the smallest marginal revenue impact. That is, despite a large number of new installations, overall growth in revenue may be unimpressive.

Reconciliation with Earlier INPUT Forecasts

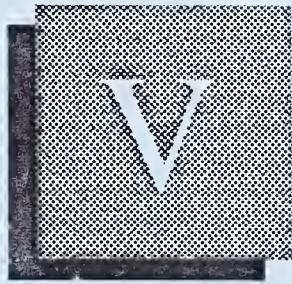
INPUT's EDI market forecast last year (see *The EDI Market: 1990-1995*) was smaller than this year's. The difference reflects a change in definition of EDI. Last year's forecast represented a correction for the highly inflated forecasts of earlier years. Last year, INPUT held to the very strict definition of EDI as implementations that used standard messages (X12, UCS, TDCC, ORDERNET, EDIFACT, and others) and purchased software and network services from commercial vendors. This year INPUT considers a variety of implementations, standardized and non-standardized. Also, last year, INPUT overlooked some important vendors to the EDI market. This year their EDI revenues are included in the forecast.

It is important to note that as with the 1990-1995 EDI market report:

- Vendor revenues from non-EDI related offerings are not included in this report's forecasts as they were in former forecasts.
- Values do not reflect other batch data transmissions that are not specifically identifiable as EDI.
- Values do not include EDI-like systems such as medical claims, or semi-EDI systems such as the Securities and Exchange Commission's EDGAR system. These systems are captive and have limited capacity for extension or growth. The vendors to these markets are, for the most part, completely different from the vendors of mainstream EDI applications.
- Dollar values are the result of EDI that is performed over public third-party networks. Private networks, and EDI via magnetic and diskette tape exchanges, are not included in the market-size numbers.

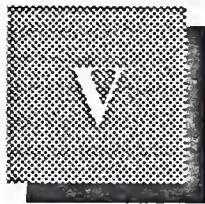
Six years of monitoring the EDI market have produced a more precise forecast model and a broader user/vendor response base with clearer distinctions between true EDI and EDI-like activities. The result is an upward adjustment in market size and better analysis of expected market growth.

A statistical reconciliation of this report's forecast with INPUT's 1990 forecast can be found in Appendix C.



EDI Market Trends and Issues

EDITION 10 | APRIL 2024



EDI Market Trends and Issues

A

Introduction

Meeting the needs of companies using EDI are software vendors, network providers, professional services firms, standards bodies, and, in some cases, large hub companies.

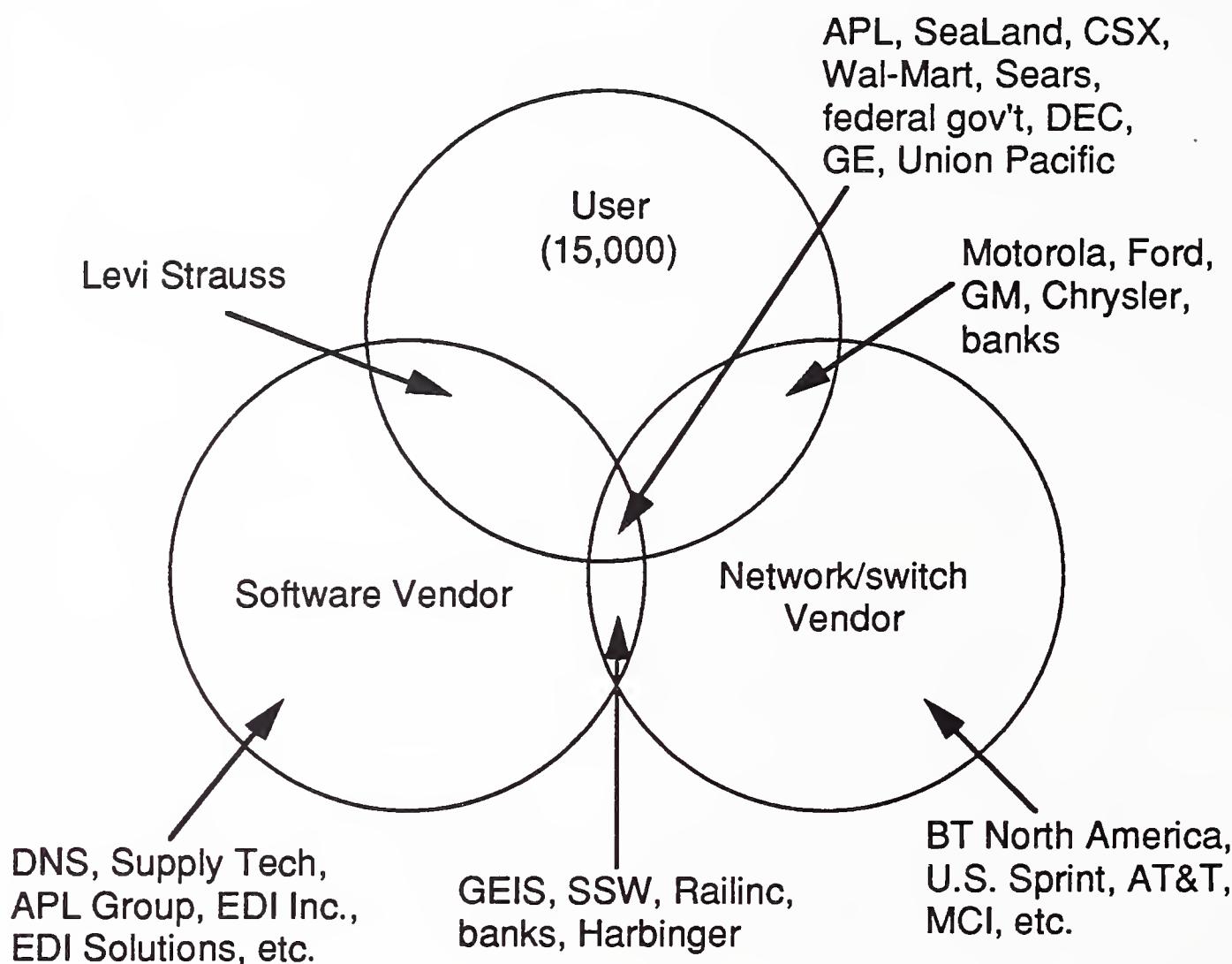
Products and services are provided by third-party vendors as well as large hub users. Software, network services, and consulting can be procured from a single source or many sources. Exhibit V-1 graphically illustrates this mix of relationships.

The exhibit demonstrates how a single company may function as two or all of the following: EDI user, EDI software vendor, or EDI network service provider. The four combined categories and representative companies which function in the indicated capacity are:

- *User-Network Provider*: Motorola, Ford, General Motors, Chrysler, Wal-Mart and major banks
- *User-Software Vendor*: Levi Strauss, Abitibi-Price, and Extol
- *Software Vendor-Network Provider*: Sterling Software, Railinc, GE Information Services, Harbinger, and many banks
- *User-Software Vendor-Network Provider*: American President Companies, SeaLand, CSX, Sears, General Electric, Union Pacific, IBM, EDS, the Federal Reserve, and Digital Equipment Corporation

EXHIBIT V-1

Players in the EDI Market Wear Many Hats



Reasons for the fluidity of player categories in EDI include:

- *Historical tradition.* EDI has traditionally been introduced by large companies as a cost reduction measure (as in the case of mass merchandisers or large manufacturers), to offer a customer service (transportation companies, for instance), or to provide a strategic link with customers (such as American Hospital Supply). These early promoters of EDI found that they could offer the expertise that they developed to others by selling software or services (Sears and GE are good examples of this).
- *Hub company subsidization.* The costs and benefits of EDI are not easily ascertained or evenly distributed between two EDI trading partners. Often the hub company has more to gain than one of its small spoke suppliers. To the hub, EDI means all suppliers are reachable electronically. To the spoke, EDI means an investment of \$5,000 to \$10,000 just to keep a single customer happy. Often the large trading partner (such as Sears) will subsidize the cost of bringing up its trading partners.

- *Proliferation of internal corporate networks driven by increasing availability of inexpensive, basic data transport service.* Corporations are finding that they can build their own data networks by leasing lines from telephone, VAN, satellite, or other types of telecommunication providers.
- *Increasing price/performance levels of communication gateway software.* Software that performs store-and-forward/switching functions is now relatively inexpensive. Corporations are discovering that they can interface directly with trading partners using dial-up telephone lines, and in some cases offer their own networks.
- *The costs of EDI education/dissemination are changing.* One of the great inhibitors of EDI is that it is not widely understood by enough of the right people (executives). Getting executives to understand EDI requires many different educational channels offering support for the EDI concept—in-house, from trading partners, from third-party consultants, from vendors of products, and from trade media. With EDI, education is critical to selling the concept. Because the EDI awareness level among business managers is slowly increasing, the party responsible for financing EDI education (vendor, trading partner, user) changes frequently.
- *Mergers and acquisitions.* Users and vendors may end up belonging to the same corporate entity. The purchase of World Trade Services (a customs broker that maintains a network for customs brokers) gave majority ownership to one of its customers, transportation user CSX.

The evolution of EDI players has resulted in a corporate schizophrenia where any two companies may simultaneously be each other's suppliers, customers, and competitors. For example, Pittsburgh National Bank supplies GE with financial services, competes with GE to provide corporations with electronic payment services, and is a customer of GE for light bulbs. Digital Equipment Corporation buys semiconductors from, sells computers to, and is willing to sell EDI software to Motorola.

Technological development is impacting the dividing line between EDI software and network services. The increasing price/performance of software is eroding some of the services of value-added networks. The blurring of functional domains between software and services is also affecting the EDI marketplace. These and other trends in the EDI market will be explored in the following section.

B

EDI Market Trends

1. What the EDI User Is Doing

This section examines the responses by EDI users to an INPUT survey requesting data regarding the user's specific usage patterns. Each user provided information regarding 1991 usage characteristics, anticipated changes over the next 12 months, and motivation for invoking (or not invoking) various EDI attributes.

a. User Expenditures for EDI

Exhibit V-2 notes the changes in expenditures on EDI from 1990 to 1991 for companies with over \$100 million in annual sales. These expenditures are compared to the change in the average number of trading partners for the same period to determine whether the cost to support trading partners is, on the average, increasing or decreasing.

EXHIBIT V-2

1990-1991 EDI Spending*

Attribute	1990 (\$ M)	1991 (\$ M)	Percent Change
Average expenditures on all EDI activity	268,000	321,000	20
Average number of trading partners	322	544	69
Average spending per trading partner	832	591	-29

*For companies with over \$100 million in annual sales

On the average, expenditures increased 20% from 1990 to 1991, while the average number of trading partners grew from 322 to 544, or a total of 69%. As a result of the trading partner population growing faster than expenditures, the average spending per trading partner declined 29%, from \$832 in 1990 to \$591 in 1991.

INPUT feels that the average trading partner value is high, and while it is representative of the survey sample, it also reflects the size of the major businesses surveyed, most of whom are multi-billion-dollar corporations that are members of large trading communities. Across the total spectrum

of EDI users, INPUT finds that 10-40 trading partners is the norm. Although seemingly few in number (relative to a given company's total base of trading partners), the 80-20 rule is most important to remember here: a handful of trading partners accounts for a majority of trade volume.

b. Growth In EDI Trading Partners

Exhibit V-3 indicates the growth in both supplier and customer partners for companies with over \$100 million in annual sales. Although the combined total is growing at 69%, suppliers (at 75%) are growing somewhat faster than customers (59%). These numbers reflect the status of the survey community which, because of the size and market position of the businesses surveyed, will tend to drive suppliers more than being driven by customers.

EXHIBIT V-3

1990-1991 Growth in EDI Trading Partners*

Attribute	1990 (\$ M)	1991 (\$ M)	Percent Change
Average number of trading partners	322	544	69
Average number of customers	123	196	59
Average number of suppliers	199	348	75

*For companies with over \$100 million in annual sales

c. Objectives for Implementing EDI

Virtually all companies, when seriously implementing EDI, will articulate a set of objectives for the EDI program. Generally, this is done at the initiation of the EDI program, but occasionally, where a vendor implements EDI in response to customer requests, serious objectives (beyond simply retaining or obtaining customer business) may follow the EDI learning and implementation curve. INPUT's customer survey indicates that the considered EDI objectives, noted in Exhibit V-4 below, are those most frequently set for an EDI program.

The most frequently noted objective was to improve operational efficiency, followed by reducing costs and attaining or maintaining a competitive advantage. Customer requirements for EDI was fifth, and reflects the fact that the larger companies surveyed felt a stronger need to improve performance and be competitive than they did to respond to demands for

EDI interfaces to their customers. Smaller companies would almost certainly reverse the priorities, since they would tend to be more driven by customer demands for EDI interfaces in order to retain clients who required it.

EXHIBIT V-4

Most Common EDI Implementation Objectives

- Improve operational efficiency
- Reduce cost
- Attain or maintain competitive advantage
- Improve customer relationships
- EDI-related partnering improvements and customer requirements

d. EDI Message Traffic Patterns

Absolute measurements of EDI message traffic are difficult to obtain, since messages can follow a variety of conduits (e.g., VAN, in-house network), some of which are difficult to monitor. INPUT asked its survey respondents to indicate their perceived changes in message traffic when they moved from a paper environment to an automated EDI environment. The results are noted in Exhibit V-5.

EXHIBIT V-5

EDI Message Traffic—Perceived Changes from a Paper Environment

Change	Percent Noting
An increase in message traffic	41
A decrease in message traffic	7
No change in message traffic	52

Not surprisingly, almost all users saw either an increase (41%) in message traffic, or no change (52%). Messages, for this response, were defined as any communication between trading partners. Most users felt that EDI opened up channels of communication and their responses reflected increased beneficial use, rather than retransmissions to correct errors.

occurring in a new communications environment. Only 7% noted a decrease in traffic from a paper environment. INPUT speculates that as EDI and the many trading communities mature, traffic will probably stabilize at predictable levels and any user entering the EDI community will be able to forecast normal usage patterns and changes from the prior paper environment.

Growth in the absolute number of EDI messages transmitted by the survey population, from 1991 to 1992, is noted in Exhibit V-6. Overall, users anticipate that their message traffic will grow by 50% over the next year. Although this seems to be an aggressive growth curve, it should be remembered that the current base of EDI usage is relatively small, and that small absolute changes will produce large growth percentages.

EXHIBIT V-6

**1991-1992
Forecast Growth in EDI Messages**

	1991	1992	Percent Change
EDI message traffic	1E+07	1.5E+07	50

e. EDI-Related Hardware Devices

EDI offers the user a variety of implementation alternatives. Those most commonly identified by survey respondents to collect or carry EDI are noted in Exhibit V-7. Not surprisingly, LANs/E-mail/office systems were noted by almost half the respondents, followed at a distance by bar code scanners and portable computers.

EXHIBIT V-7

**Most Commonly Used Devices
to Collect or Carry EDI**

Device	Percent Using
LANs/E-mail/office systems	48
Bar code scanners	19
Portable computers	17

f. EDI Applications

EDI users were asked to identify applications that had been integrated into their EDI software. "Integrated" was defined to mean that the data used with the application was directly transferred into or out of EDI transmissions with trading partners without any human rekeying of data. From the responses, INPUT compiled a list of the five most commonly noted applications. The most popular applications for EDI have traditionally been those associated with purchasing. EDI users confirmed this in their survey responses, summarized in Exhibit V-8. Since multiple responses per user were possible, the percentages indicate the frequency of application appearance in user responses. Purchasing, though the predominant application (identified by half the respondents), was not noted by all respondents. Although purchasing is the most common EDI application, contrary to the popular image of EDI as almost always being initially invoked as a purchasing tool, it has not been implemented in all EDI installations.

EXHIBIT V-8

Top Five EDI Applications

Application	Percent EDI Users Performing
Purchasing	50
Sales/order entry	38
Accounts payable	35
Funds transfer	33
Traffic management	27

g. VAN Services Used with EDI

Exhibit V-9 notes the frequency with which users identified their use of various levels and types of VAN service(s).

Two-thirds of the respondents noted that they used only basic VAN services. Electronic mail (38%) and EFT (27%) were the next most popular offerings, followed by trading partner implementation programs (23%). Only 6% noted that no VAN services were used, with EDI transmissions using proprietary facilities.

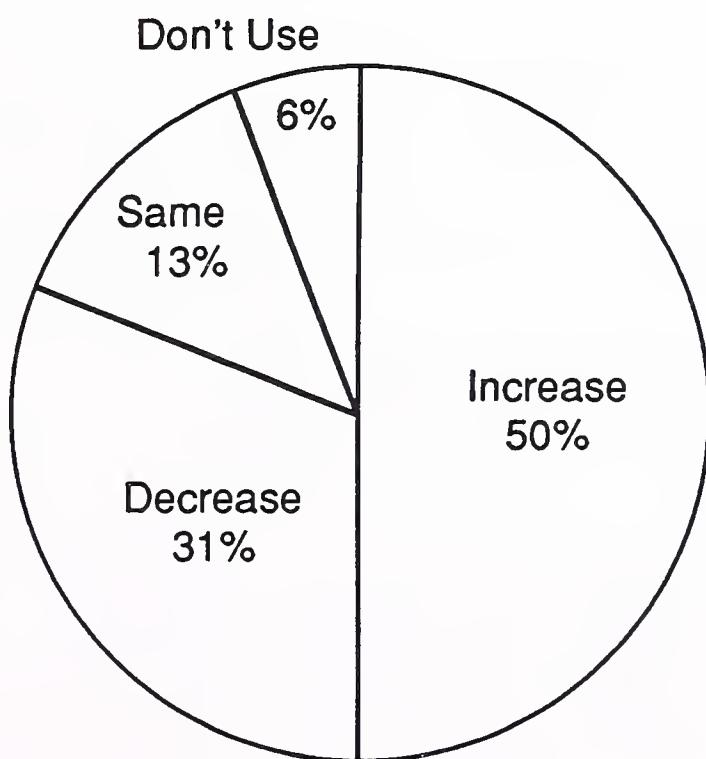
EXHIBIT V-9

VAN Services Used with EDI

Type of Service	Percent Noted in User Survey
Basic service	67
Electronic mail	38
EFT	27
Trading partner implementation program	23
On-line catalogs, data bases, directories	13
Other	25
None	6

Exhibit V-10 notes users' forecast of changes in their VAN usage patterns. Fifty percent indicate that VAN usage will increase; 13% expected it to remain the same; and 31% believed that it would decrease in the future.

EXHIBIT V-10

Forecast Changes in VAN Usage Patterns by EDI Users

The percentage of users decreasing their use of VANs indicates their recognition of the inherent economies of establishing a proprietary communications resource once usage volumes reach higher levels. Rather than continue to pay on a per transaction basis, even with volume discounts, larger users quickly find that costs can be better contained at the plateaus offered by in-house (or proprietary) networks.

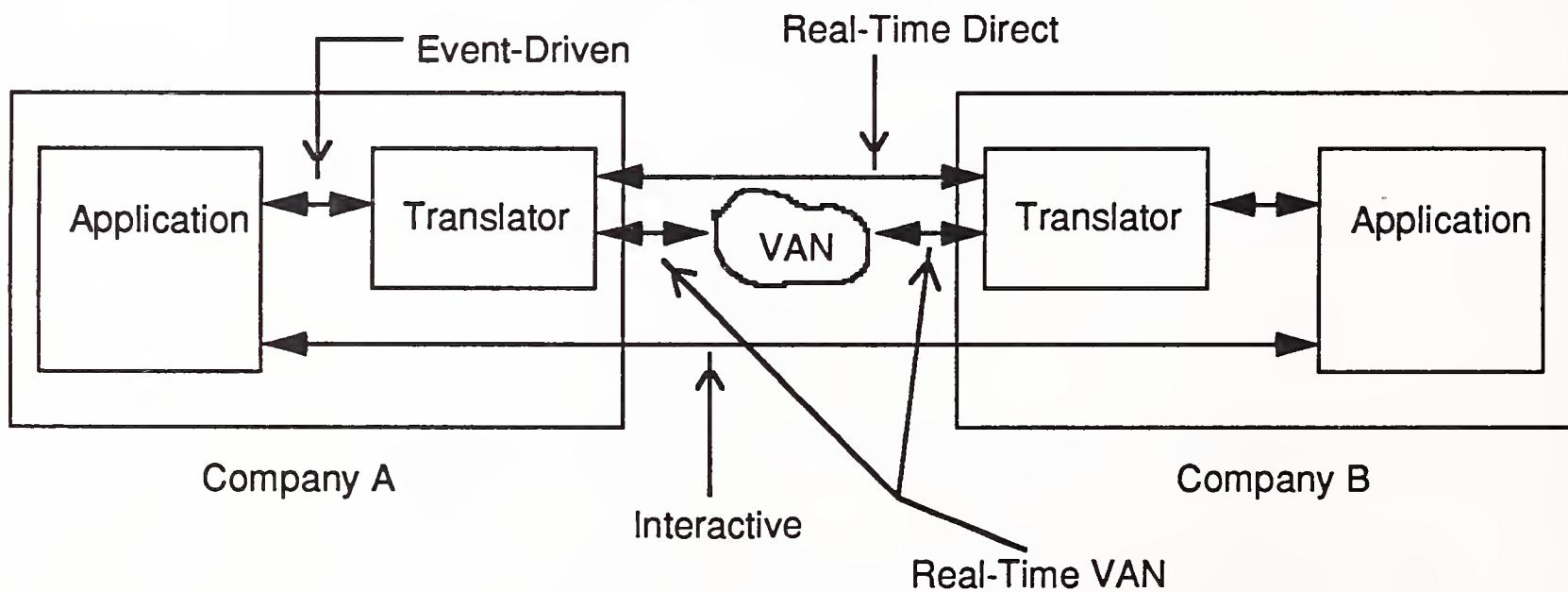
Those indicating that they did not use VANs also indicated that they didn't plan to change that decision.

h. Real-Time EDI

Real-time EDI has an apparent attractiveness, since it implies a faster response than that associated with the typical batch clearing technique most commonly used between trading partners. There are three types of real-time EDI, as shown in Exhibit V-11. INPUT allowed interviewees to refer to all three variations when responding to this question. (See Appendix D for the exact wording of the question.) More than 50% of users surveyed by INPUT noted that they would like to have real-time EDI; 12% said that they were already doing it; and 36% said that they didn't see a need for it. These figures are graphically presented in Exhibit V-12 below.

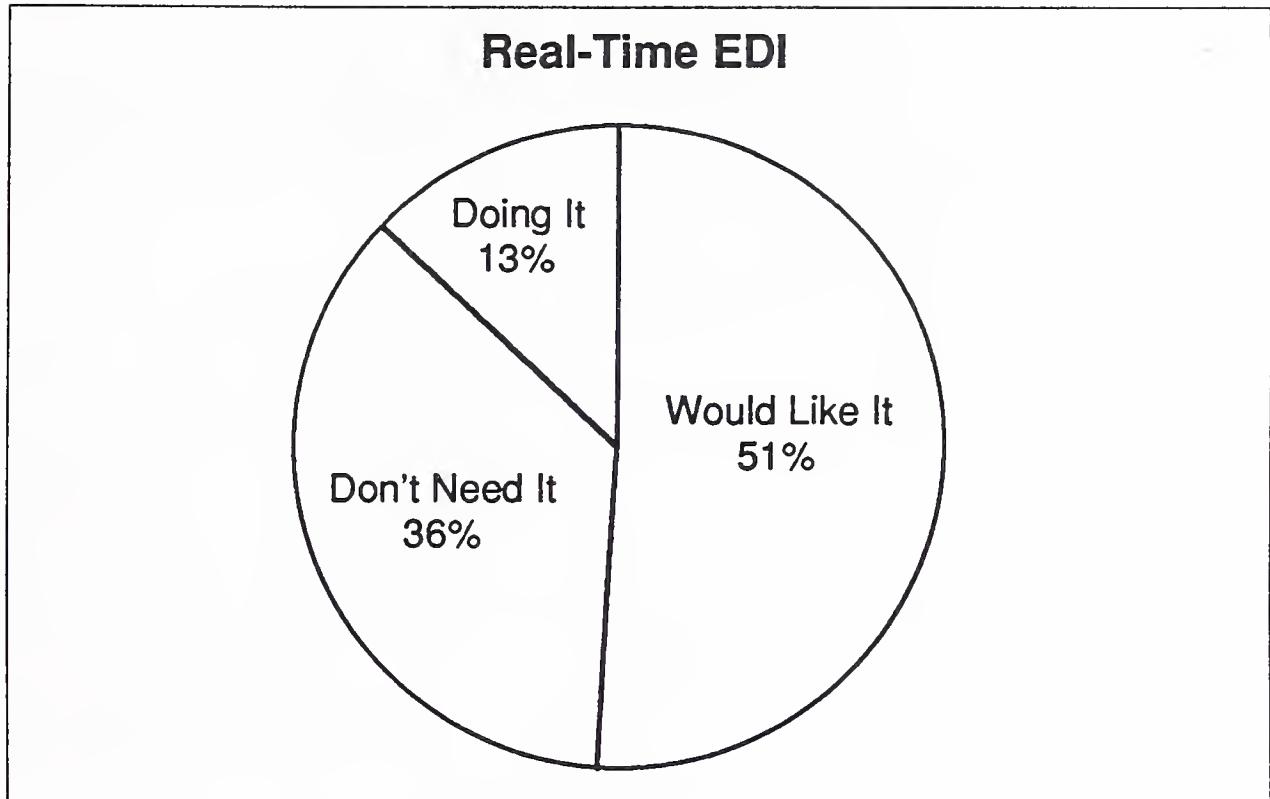
EXHIBIT V-11

The Different Kinds of Real-Time EDI



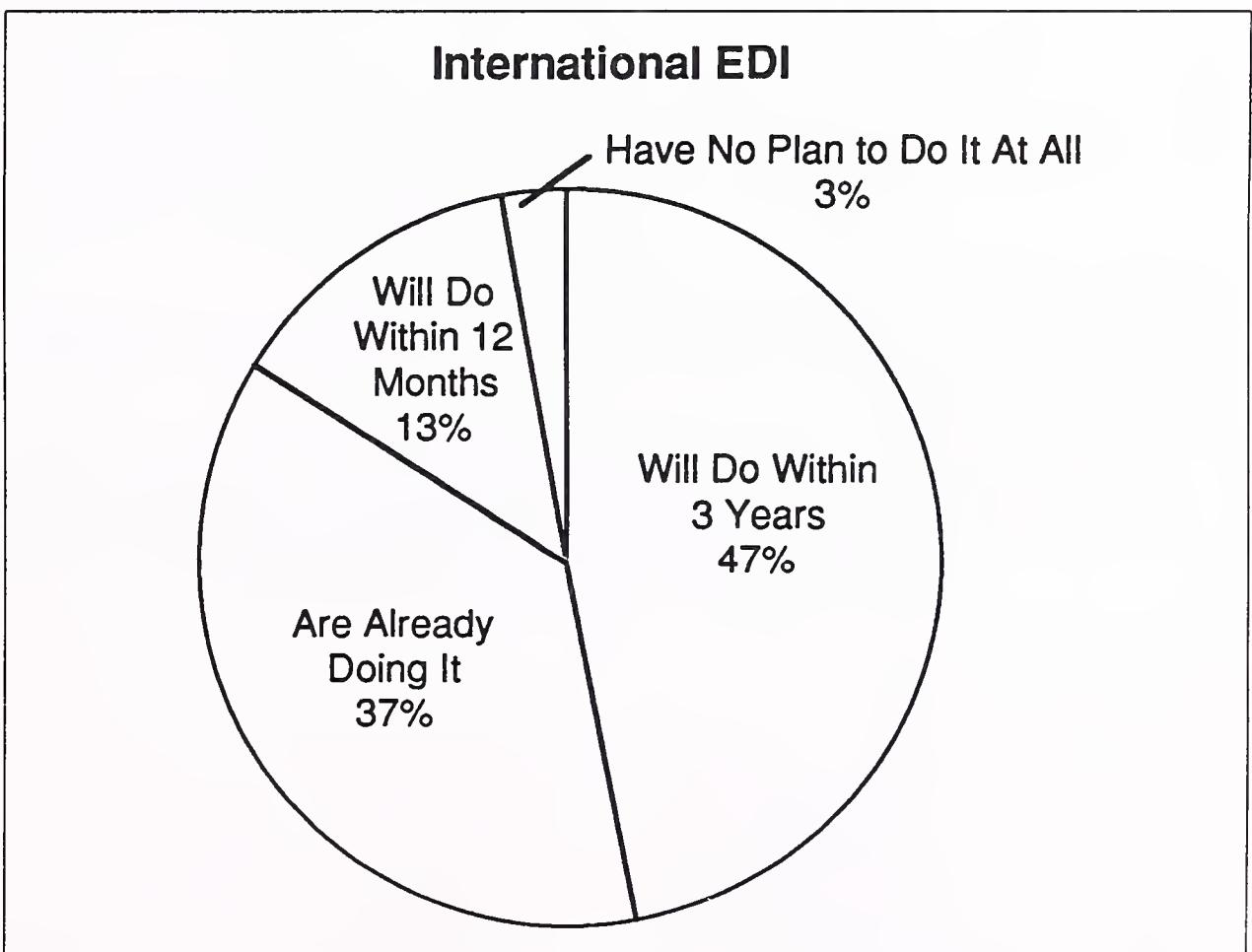
- Real-time—Messages are sent between trading partner gateways/translators with no or little delay (15 minutes) in turnaround after receipt
- Event-driven—Applications and translator exchange message sets as soon as they are created or received
- Interactive—Two applications exchange data directly within a preprogrammed context of conversational possibilities

EXHIBIT V-12

**i. International EDI**

Like real-time EDI, international EDI is a logical extension of the basic EDI implementation. Thirty-seven percent of the users indicated that they were already doing EDI in the international marketplace; 13% said they would implement it in the next 12 months; 47% within the next three years; and 3% said they have no plans to do international EDI. Exhibit V-13 graphically portrays this data.

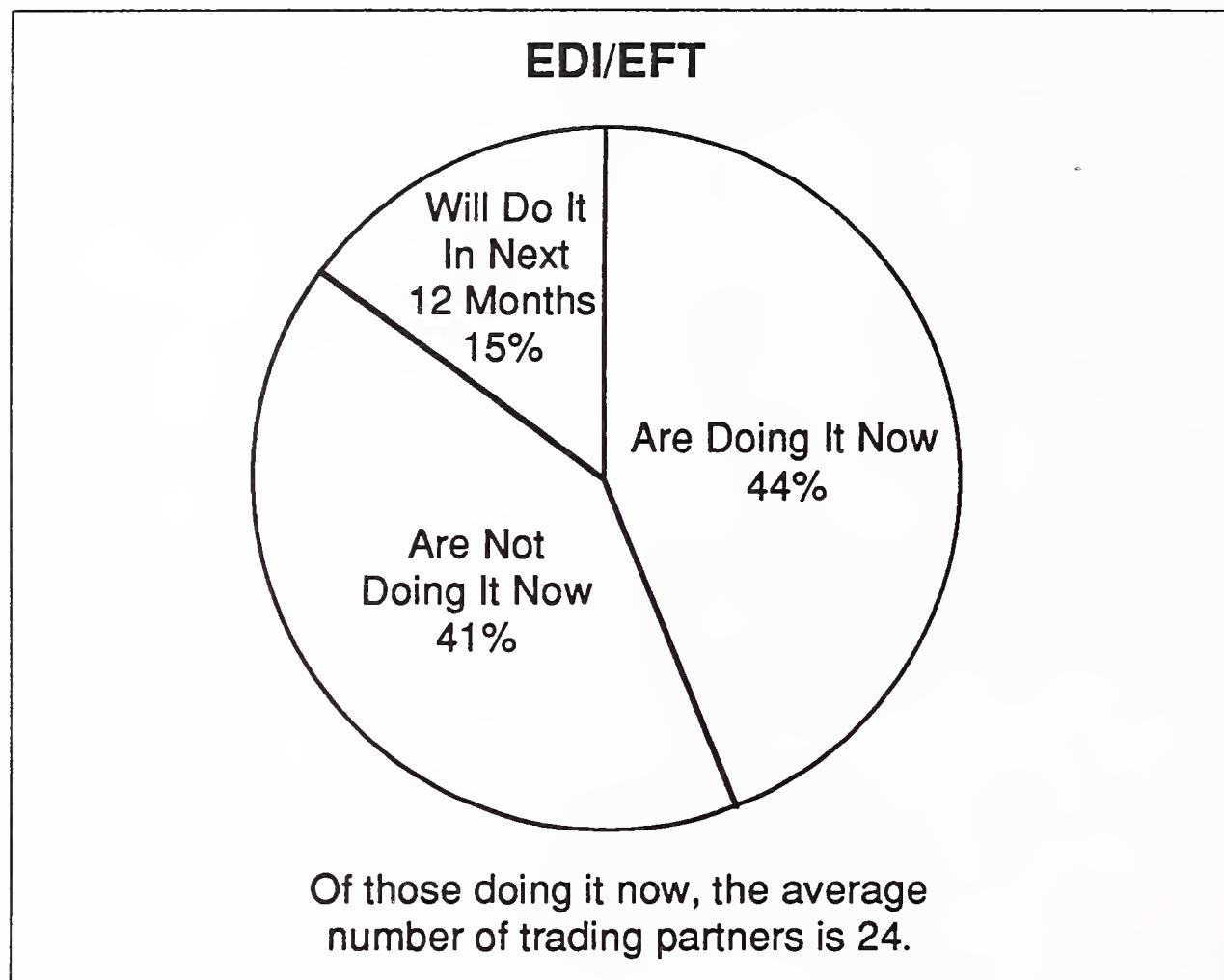
EXHIBIT V-13



j. EDI/EFT

INPUT asked users if they were using EDI/EFT to pay (or receive payments from) trading partners. The response is noted in Exhibit V-14 below.

EXHIBIT V-14



The respondents indicated that 59% of those surveyed are either doing EDI/EFT now (44%) or will do it in the next 12 months (15%). Forty-one percent are not doing EDI/EFT at this time, and do not plan to implement it within the next twelve months.

For those who now do EDI/EFT, the average number of trading partners is 24.

Those who currently use EDI/EFT also (obviously) perform other EDI applications. Exhibit V-15 notes the percentage of EDI/EFT users who also are performing the indicated application. Not surprisingly, EDI and EFT applications tend to support each other.

EXHIBIT V-15

EFT Users Also Use EDI

Application	Percent of EFT Users Implementing Application
Funds transfer	67
Purchasing	52
Accounts payable	48
Sales/order entry	33

EDI and EFT applications tend to support each other

2. The Operational Context of EDI

In its user survey, INPUT also determined the characteristics of the EDI implementation programs in use by the survey respondents. This section further examines these characteristics, and notes, where possible, attributes by two categories of company size—over \$1 million and up to \$1 billion in annual sales, and over \$1 billion in annual sales.

a. EDI Usage and Support Profiles

INPUT examined the average 1991 EDI expenditures, staff sizes, number of trading partners, percentage of orders submitted via EDI and level of satisfaction with EDI programs for its survey population. Responses were grouped into the two categories noted above and analyzed.

The largest companies (over \$1 billion) spent, on the average, more than three-and-a-half times as much on their EDI programs as did the less than \$1 billion companies. The largest company staffs were more than twice the size (16 people, on average, versus 7), they had almost eight times as many trading partners (432 as opposed to 58) and their percentage of purchase orders received via EDI was almost three times as great (28% versus 10%). These figures are tabulated in Exhibit V-16.

EXHIBIT V-16

EDI Usage/Support Profile Large Companies

Company Size (\$ Sales)	EDI Expense (000)	EDI Staff (People)	# Trading Partners	EDI % \$ of Orders	Satisfaction Level*
Over \$1 billion	479	16	432	28	3.6
Over \$1 million to \$1 billion	132	7	58	10	3.25

* 1 = Low, 5 = High

Size, however, seemed to have nothing to do with satisfaction. The larger companies were marginally more satisfied (3.6) with their EDI programs than their slightly smaller counterparts (3.25), but, as measured on a satisfaction scale where 1 is least satisfied and 5 is most satisfied, both groups indicated a general feeling of satisfaction with EDI. Clearly, there is room for improvement, but at this early stage in the life cycle of the EDI concept, a response of "pretty good" is a good sign of things to come.

INPUT speculates that the average number of trading partners for the larger companies (432) is probably high, and biased by the unusually large number of trading relationships of a small number of respondents.

b. Impact of EDI

Exhibit V-17 summarizes the user responses regarding the impact of EDI on their businesses. As with the usage and support profiles, responses are categorized by company size.

EXHIBIT V-17

Impact of EDI on Large Companies (Percent)

Company Size (\$ Sales)	Improved Way of Doing Business	None See Yet	Real \$ Savings	Improved Customer Service	Better Terms with Trading Partner	A Cost of Doing Business
Over \$1 billion	35	27	24	11	5	3
Over \$1 million to \$1 billion	33	11	11	33	-	11

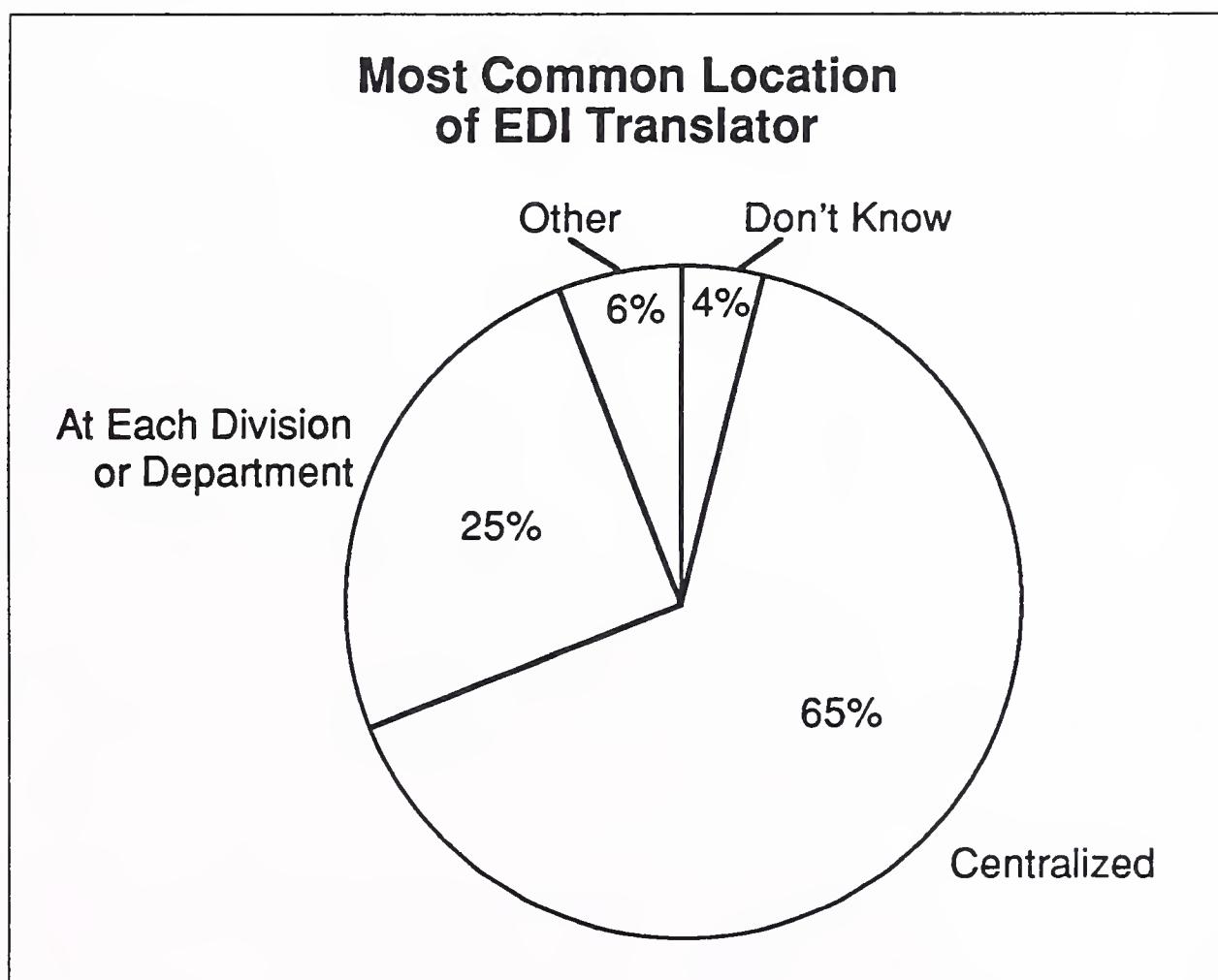
Multiple responses allowed

Approximately one-third of respondents in each category felt that EDI had improved the way they did business. From that point on, however, responses to other questions differ. Twenty-seven percent of the largest users had not seen any EDI-related business improvements as yet, and 11% of the \$100+ million firms saw no improvement. Real dollar savings were realized by 24% of the larger firms, but again, only 11% of the \$100+ million businesses had experienced that benefit. Although the smaller firms were uncertain as to real dollar savings, one-third did feel that EDI had helped to improve customer relationships as opposed to only 11% who noted this in the over \$1 billion group. Neither group was certain as to EDI's affect on their trading relationships ("Better Terms with Trading Partner"), and small percentages of both groups (3% and 11%) viewed EDI as a "Cost of Doing Business." The sample size for the \$100 million to \$1 billion group was small enough to be biased by one or two extreme responses, but the general reaction framework indicates a note of cautious optimism regarding EDI's impact on their businesses.

c. Most Common Location of the EDI Translator

INPUT combined user responses to develop an indication of the most common locations for an EDI translator. The results are displayed in Exhibit V-18.

EXHIBIT V-18

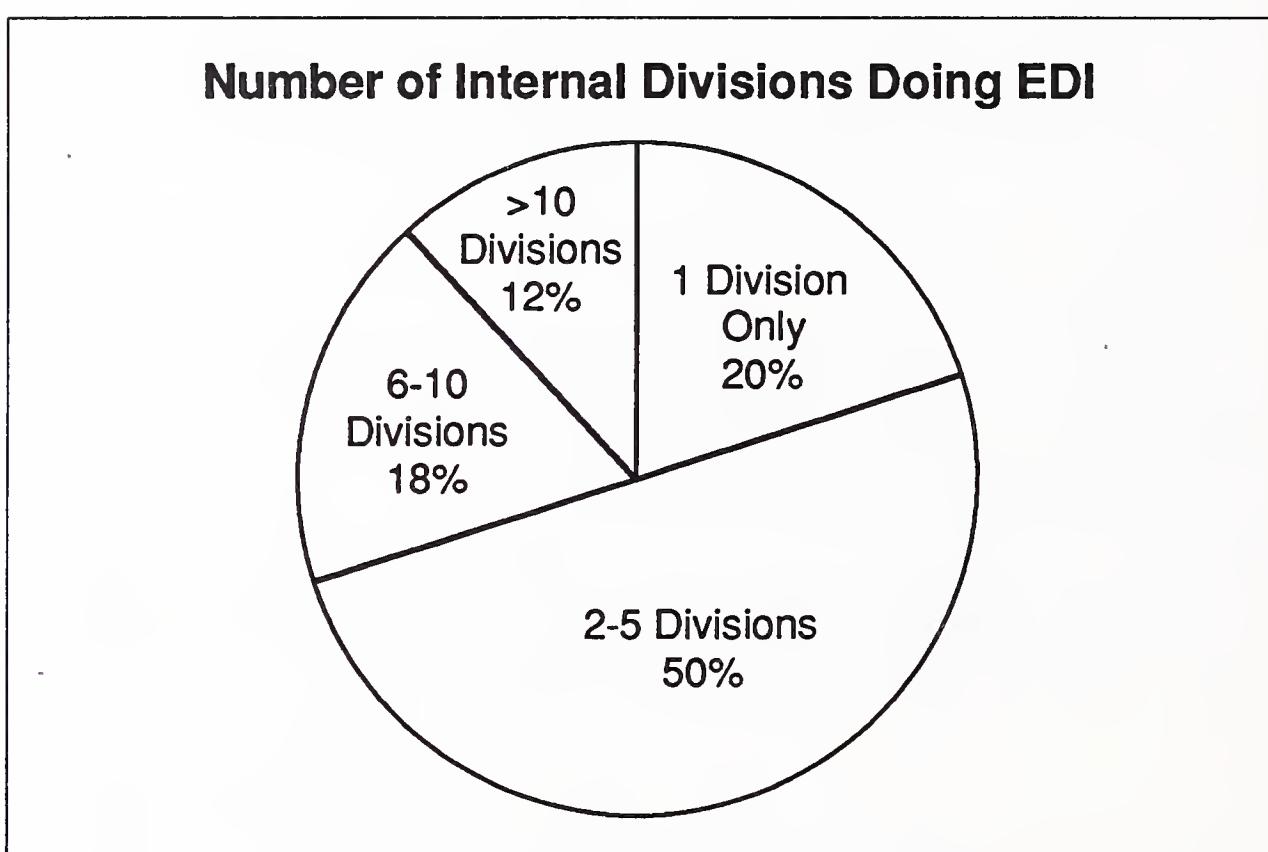


Almost two-thirds of the respondents used a centralized translator, while one-quarter placed a translator at each division, department or operating entity. Six percent used other locations, and a surprising 4% didn't know where their translator was! The numbers indicate a clear preference for the most logical translator implementation—centralized.

d. Divisions Performing EDI

For those companies with multiple divisions (all of the sampled population), Exhibit V-19, shows the distribution of divisions within a company, on the average, that perform EDI.

EXHIBIT V-19



Twenty percent of respondents indicated that only one division is doing EDI, 50% have two to five divisions on-line, 18% six to 10 divisions, and 12% have more than 10 divisions performing EDI activity. Although corporate divisional organizations vary widely in both numbers of divisions and how the operating entities are grouped, there emerges, at the level of \$100 million or more in annual sales, a clear indication that two to five divisions, on the average, perform EDI.

e. Stimulus for Implementing EDI

The primary objectives for implementing EDI, noted in Exhibit V-4, are not necessarily the real reasons that EDI was invoked. Objectives tend to benefit from hindsight, and when viewed in retrospect, tend to support observed benefits. This does not make the stated objectives invalid, it simply means that reasons for beginning EDI vary somewhat from the reasons it now continues to function and grow as a corporate resource.

Exhibit V-20 notes the responses received from INPUT's survey of EDI users, when asked for the stimulus at the birth of EDI in their corporation. Users were only allowed three options for response: customers asked for it, the company itself asked for it, or the ever-present "other."

EXHIBIT V-20

Stimulus for Implementing EDI

	Percent
• Customers asked for it	40
• Company asked suppliers	38
• Other reasons*	22
- Company asked customers	
- A little of both	
- Industry initiative	
- Competitive necessity	
- Suppliers asked company	

* None greater than 5%

The two categories were about evenly split. Forty percent indicated that their customers asked for EDI, while 38% asked their suppliers. Of the remaining 22% (or "other reasons" category), less than 5% indicated any one reason. Responses included that the company had asked its customers to implement EDI, some company and some customer requests ("A little of both"), it was an industry initiative, it was a competitive necessity, and suppliers asked the company.

f. Conditions Favoring EDI Use

As users have gained experience with their EDI programs, an analysis of their responses to questions regarding the objectives for embryonic and established EDI programs and the stimulus for initially implementing their EDI program allows identification of the factors or conditions favoring EDI use. These conditions are noted in Exhibit V-21.

EXHIBIT V-21

Conditions Favoring EDI Use

	Percent
• Repetitive orders with major trading partners	68
• Use only with those partners requesting it	30
• Small dollar amounts*	14
• Other conditions (none > 5%)	25

* Small dollar amounts never offered as a single condition, but always with another reason

** Multiple responses allowed

By far the most important motivator is the need to handle repetitive orders with major trading partners (68% of the respondents indicated this). Thirty percent said that although they have EDI capability, they only use it with trading partners that request it. Small dollar amounts were noted as a condition by 14% of the users, but this alone was not sufficient cause for invoking EDI—it always appeared in conjunction with some other condition.

g. Most Common EDI User Profile

The matrix below (Exhibit V-22) summarizes the user characteristics noted in Section 2 of this chapter, and includes a reprise of the most common applications drawn from the “Top Five” list (Exhibit V-8), international EDI use (Exhibit V-13) and EDI/EFT activity (Exhibit V-14).

As viewed across the total respondent population, the most common user of EDI: performs purchasing, sales/order entry, accounts payable and funds transfer applications; has a centralized translator; has one to five divisions (70% of respondents) doing EDI; is using international EDI now or will use it in 12 months (50%); and is using EDI/EFT now or will use it in the next 12 months (59%).

EXHIBIT V-22

Most Common EDI User Profile

Attribute	Most Common
Applications	Purchasing (50%) Sales/order entry (30%) Accounts payable (35%) Funds transfer (33%)
EDI translator location	Centralized (65%)
Division doing EDI	1-5 (70%)
International use	Now or in 12 months (50%)
EFT use	Now or in 12 months (59%)

EDI can also be regarded as a customer interface. From this viewpoint an average EDI user profile can also be constructed, as demonstrated in Exhibit V-23.

EXHIBIT V-23

EDI As a Customer Interface

- The average EDI user
 - Has 196 customers using EDI
 - Receives 22% of purchase orders via EDI
 - Which represents 32% of total dollar volume of all purchase orders received
 - Would need to have approximately 450 customers before EDI submission would represent 50% of purchase orders received
 - At that level, the EDI purchase orders would represent 73% of purchase order volume

In this orientation, the average EDI user has 196 customers using EDI, receives 22% of purchase orders (representing 32% of the dollar volume of all purchase orders) via EDI, and would need about 450 customers (total) before EDI submissions would equal 50% of all purchase orders received. At the 50% absolute order level, EDI purchase orders would represent approximately 73% of total purchase order dollar volume.

Since the data did not allow INPUT to relate the number and dollar volume of purchase orders to the specific customers placing those orders, it was not possible to test the 80/20 rule—80% of all orders are generated by 20% of the customers. INPUT believes, however, that the rule generally holds and that the 73% of purchase order dollar volume noted in Exhibit V-22 is generated by slightly less than 20% of an EDI user's customers.

3. Selected EDI Industry Profiles

The respondents to INPUT's survey of EDI users represented twelve different industries. For many of those industries, the sample sizes were large enough to permit reasonable industry generalizations. For a few, the sample size was so small that it could only be regarded as representative of the respondent's EDI implementation environment. Those industries for which respondent data permitted a viable industry analysis are the process manufacturing, discrete manufacturing, transportation, distribution and banking industries. Observed trends in the implementation of EDI for these industry groups is discussed in this section.

a. Systems That Support EDI

INPUT asked all respondents to indicate their most common devices used with EDI, their use of third-party network resources and their reliance on such resources, their use of local-area networks (LANs) or wide-area networks (WANs), and their interest in real-time EDI. Exhibit V-24 tabulates the responses for the five selected industries and, for comparison purposes, offers the figures for the total surveyed population ("All Users").

EXHIBIT V-24

Systems That Support EDI
All Users and Five Selected Industry Groups

Most Common Characteristic	Percent					
	All Users	Process Mfg.	Discrete Mfg.	Transportation	Distribution	Banking
• Most common EDI device*						
- LAN/O.E./E-mail	40	29	41	51	27	95
- Bar code scan	19	27	29	25	23	-
- Portable computer	17	-	-	-	-	25
- Hand-held device	13	-	24	24	-	-
• Third-party network use*						
- Basic services	67	71	65	95	77	96
- E-mail	38	-	41	75	48	-
- EFT	37	-	35	-	-	-
- Trading partner program	23	43	-	-	49	-
• Reliance on third-party networks						
- Increasing	50	42	41	26	25	27
- Same	31	29	40	49	75	48
- Decreasing	13	29	6	25	-	25
- Uncertain	6	-	13	-	-	-
• Availability of LAN or WAN						
- Have one	90	86	94	75	72	95
- Don't have one	6	14	6	25	28	5
- Uncertain	4	-	-	-	-	-
• Real-time EDI						
- Want it	51	57	53	50	93	35
- Now use it	36	-	29	25	7	-
- Don't need it	13	43	18	25	-	65

*Multiple responses possible

Regarding devices most commonly used with EDI:

- Everyone uses LANs/office environment (O.E.)/E-mail, but banking is by far the heaviest user, and the process manufacturing and distribution industries are the lightest users. Only banks used portable computers, and only discrete manufacturing and transportation industry respondents noted that they used handheld data collection devices.
- With the exception of the discrete manufacturing industry, the other selected industry respondents were heavier users of basic third-party network services than the average of the total survey population. Only discrete manufacturing respondents noted that they used EFT, and only the process manufacturing and distribution industries indicated participation in trading partner implementation programs.
- No clear industry pattern of trends in the dependence upon third-party networks has emerged, and the five industry segments appear to be following the trend of the total EDI user population towards maintaining or increasing their reliance on third-party networks. The only discrepancy of note is the indication that the move by the process manufacturing, transportation and banking industries away from such reliance on outside networks is twice the average of the total population.
- Not surprisingly, almost all EDI users, regardless of industry, have LANs or WANs. Of interest is the heavy usage by the processing and discrete manufacturing and banking industries.
- The jury is still out on real-time EDI. Many respondents have probably indicated an interest in such a capability merely to encourage availability if, in the future, they should find that they really want or need it. The two exceptions are distribution, which clearly notes a requirement for real-time EDI (93% want it), and banking, which strongly indicates (65%) that they don't see a need for it (even though 35% note that they want it).

b. EDI Initiative/Motivation

INPUT questioned respondents about why they started doing EDI and, once implemented, what was the driving force behind the program. The responses for the five selected industry groups are noted in Exhibit V-25. Note that multiple responses from each respondent were possible.

EXHIBIT V-25

EDI Initiative/Motivation—Selected Industries

Industry	Initiative for Using EDI (Percent)*		Driving Force for EDI Program (Percent)*		
	Your Customer	Your Company	Customer Satisfaction	Operating Efficiency	Competition
Discrete Manufacturing	53	59	47	88	6
Process Manufacturing	43	57	42	86	44
Transportation	75	50	95	91	-
Distribution	25	75	72	95	23
Banking	75	-	52	93	49

*Multiple responses possible

- The manufacturing industries implemented EDI under roughly equal pressures from their customers and their own companies. The transportation industry is lightly biased and the banking industry heavily biased toward responding to customer requests for EDI. Only the distribution industry noted a strong internal (company) drive towards injecting EDI into its mix of business activities.
- Once implemented, the driving force behind established EDI programs is operating efficiency. Customer satisfaction is very important, as is (to a lesser degree) response to competitive pressures, but the clear message from the industry responses is that EDI improves operating efficiency. Customer satisfaction helps to generate sales and retain established customers. Competitive pressures invoke responses usually aimed at retaining or increasing market share. But operating efficiency falls straight to the bottom line, and increases profits. The survey respondents are all major U.S. corporations with annual sales of \$100 million or more. They didn't get that large by ignoring fundamental business truths. Another truth that is coming to be recognized is that a good EDI program is good business. It promotes ordering and order-response efficiencies that can be directly translated into reduced inventories, fewer errors, faster response, and other benefits which help to generate profits.

c. Industry Growth Projections

The readers of INPUT industry reports are usually most concerned with knowing where the industry is headed, and how, through an analysis of its spending patterns, it plans to get there. They also want a sizing of the opportunity these industries offer, as determined by dollar volumes or percentage growth rates. Exhibit V-26 offers a tabular summation, by five industries, of the objectives/strategies for EDI programs, the overall level of satisfaction with such programs, and the projected 12-month growth, by industry, in trading partners and EDI expenditures.

EXHIBIT V-26

Industry Growth Projections—Selected Industries

Industry	Objectives/Strategies for EDI Program (Percent)				Satisfaction Level with EDI Program	Projected 12-Month Growth (Percent)	
	Improved Way of Doing Business	Improved Customer Service	Real \$ Savings	None		Trading Partners	EDI Expenditures
Discrete Manufacturing	41	6	6	24	High	15	-7
Process Manufacturing	29	14	31	11	High	58	40
Transportation	77	27	72	-	High	46	39
Distribution	74	24	-	-	High	42	38
Banking	-	28	25	53	Satisfied	448	27

- All industries except banking see EDI as an improved way of doing business, although process manufacturing does not have a strong response in this area. This recognition is consistent with the strong operating efficiency implementation objective noted in Section b., above.
- All industries see improved levels of customer service resulting from an EDI program, but this is not a major force driving EDI programs.
- Real dollar savings have been seen by all but the distribution industry, but with the exception of the transportation industry (where 72% of the respondents noted a hard dollar benefit); such savings have been seen by only 6% to 31% of the other industry respondents. The message, however, is that EDI can generate real savings, and those industries not

achieving the 72% response level recorded by transportation should ask themselves why they are not performing at that level. Most often, the reasons for failure to see significant real dollar savings are: the user EDI program is not yet fully implemented; the trading community is still too small to generate significant savings; effective and accurate measurements for tracking EDI performance are not yet in place; and users see EDI as one of many effective business tools that are used in today's competitive markets. They view its use as a reasonable cost of doing business, incorporate that cost into other business costs, and do not measure it separately—so real dollar savings cannot be directly attributed to it.

- Discrete manufacturing and process manufacturing each have small percentages of users who, as yet, have no objectives or strategies for their EDI programs. Half of the banking respondents state that no strategies or objectives exist. These answers are consistent with their cautious answers in the three previous columns in the diagram. The transportation and distribution industries both felt strongly that EDI has improved their way of doing business and, not surprisingly, they have established objectives and strategies to continue to realize the benefits of EDI.
- All industry responses, except banking, noted a high level of satisfaction with each user's EDI program. Banking is in the middle of the satisfaction scale and will probably not experience an improvement in satisfaction level until more specific strategies and objectives are established for EDI in that industry and tangible results are seen.
- With the exception of discrete manufacturing and banking, all industries see a 12-month increase in their trading partners of 40% to 50%. Discrete manufacturing expects only a 15% growth in trading partners, a sign that most of those interested in implementing EDI (at this time) in that industry have done so. This condition is consistent with a projected 7% decrease in EDI spending over the next year. Banking, starting from a relatively small base of users, expects to see a quadrupling of trading partners in the next twelve months, but to achieve this, only expects to increase EDI spending by 27%. However, banks offer EDI as part of their full-service offering to commercial banking customers, and will expect most of the implementation costs to be financed by these customers as part of their normal banking relationship.
- The growth, by industry, in EDI expenditures, is noted in the last column of the exhibit. With the exception of the discrete manufacturing industry, the other business segments are anticipating growth rates of 27% to 40% in EDI expenditures. Process manufacturing (40%), transportation (39%), and distribution (38%) all show strong EDI programs which are maintaining a steady growth pattern. Vendors of EDI products and services should view these industries as offering enhanced opportunity

for product sales. The slightly lower growth rate projected by the banking industry (27%) may be deceptive, since the growth in banking trading partners may be greater than implied by the growth in EDI expenditures.

C

EDI Issues

In the conduct of its EDI program, INPUT has many opportunities to define contemporary, critical EDI issues and to record them when they are identified by members of the EDI community. This section discusses issues deemed most important to the growth and success of EDI by INPUT and its contacts among the broad family of EDI users and the vendors of EDI products and services.

1. Growing the EDI Community

Users and vendors both perceive the overall growth of the EDI community as the most significant EDI issue. This concern with or desire to expand the scope and magnitude of EDI activity is stated in a variety of ways.

Many refer to attaining critical mass for EDI. By this they mean that the population of EDI users must grow to a size that provides them with *de facto* business legitimacy. Worldwide, nationwide or industrywide, EDI must become not only an accepted means of transacting business between trading partners, it should become the *preferred* means for such relationships. Logically, the acceptance migration will move from industry to national to worldwide, and will be the result of the intensive, focused efforts of large companies that see EDI as a significant benefit and as a tool for improving the way they do business.

Vendors and users agree that technical issues (e.g., technical capabilities or resources) are not the factors currently limiting EDI growth. Rather, it is the business community's slow acceptance of EDI that has restricted growth. Many reasons for this are obvious. EDI, although offering a faster, more efficient way of performing transactions between trading partners, is not a new capability but rather an evolutionary, more efficient technical function replacing an older, manual (or partially automated) activity that is deeply entrenched in established business relationships. For many companies, implementing EDI doesn't mean just redoing an application or two, but changing a major portion of the way they do business. The implementation of EDI, in many ways, is similar to the implementation of a quality program in that the concept is popular, implementation is complex, and it is easy to become disillusioned and fall back to the old ways. Stated another way, people are simply reluctant to change an old system that is working reasonably well—even though that system

has inherent limitations and inefficiencies that are minimized or eliminated by the new capability. Fully implemented, EDI changes the way a company does business, and most companies today are reluctant to take what they perceive as a large step.

Although EDI supporters wish it were otherwise, the fact is that EDI will probably continue to grow at a slow but steady pace for the next decade. The 21% CAGR for EDI services and software revenues forecast by INPUT for the next five years (through 1996) is predicated on a 1991 base of \$231 million. Although a reasonable number for annual sales for a corporation, that number (for all EDI product-related revenues) is just large enough to place the whole EDI product and services marketplace at the low end of annual sales for those companies responding to INPUT's EDI user survey. This is not intended to denigrate these revenues, but merely to indicate that the market for EDI products and services is in its infancy, is still small, and that a 21% growth rate on such a base is reasonable, not overly optimistic and not an indication of rapid growth. Another viewpoint of the EDI marketplace was offered by one interview respondent—to provide a feel for the size of the current EDI marketplace, he noted that only 30 thousand to 50 thousand businesses *worldwide* were doing EDI today, compared to a total of more than 6 million businesses in the U.S. alone. The message seemed obvious. By that measure, less than 1% of U.S. (and worldwide) businesses are currently using EDI.

Before significant growth can occur, the ripples of EDI trading relationships will have to continue to expand much further than they have so far, and more and more large, industry-driving corporations will have to declare their intent to transact their purchases (and, perhaps, sales) only through EDI interconnects. Such a movement is inevitable—the intrinsic benefits to EDI are simply too important to corporate interests and performance to ignore (or delay) for long.

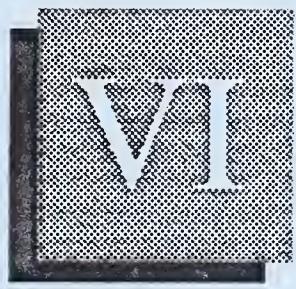
2. Standards

Standards are always an issue and a subject of controversy. They are too rigid or too loose, too slow to develop or are rushed, without thought, into the user community. Good or bad, invoked or ignored, everyone has an opinion on standards and their effect on the EDI marketplace. Without belaboring the point, INPUT believes that the following summarizes the main standards issues:

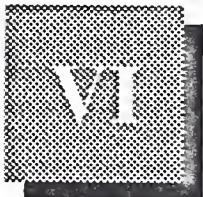
- The X.12 standards are a major step in the right direction, without which EDI, as a practical business tool, would not exist. But they do not realistically accommodate existing business practices. Before EDI can achieve more significant growth, practical modifications to the existing

standards will be necessary. Some restrictions are that current X.12 standards are incapable of characterizing products, embody a hierarchical design that is difficult to process, and support the contention that rigidly following an evolutionary path inevitably leads to errors.

- More attention needs to be given to the development of people-related (for example, insurance documents and university transcripts) formats.
- Interactive EDI will inevitably require formats for real-time activities. Such formats must be incorporated into the standards.
- Redundant and unnecessary data elements must be eliminated. They clutter the data path, slow processing and add to human error.
- Standards bodies move at a glacial pace. To avoid contention, most standards bodies seek consensus. Across an international membership of (potentially) all corporations, however, consensus will never occur, most standards will be compromises that satisfy no one, and progress will be measured in decades. Efforts must be undertaken by the stronger members of the standards bodies to move the process ahead at a faster pace, with more attention to the realities of the marketplace and less concern for complete agreement. If this occurs, the resulting X.12 standards (and modifications) should speed a growing acceptance of EDI in the world marketplace, to the benefit of users and vendors alike.
- There is a continued need for improved inter- and intra-enterprise interconnects. Although not critical to the intrinsic implementation and value of EDI, such interconnects facilitate use and speed implementation, thus aiding in the steady growth of the global EDI function.



Vendor Profiles



Vendor Profiles

A

Introduction

This chapter offers condensed profiles of a representative selection of vendors of products and services to the EDI marketplace. It is not a comprehensive profiling of all the 80-plus vendors of EDI software and services, and does not include even market leaders. For a comprehensive list of EDI vendor profiles, please refer to INPUT's *EDI Vendor Profiles* loose-leaf binder.

For each vendor, INPUT lists its name, address and telephone number, and a summary of the company's background, organization, defined market and major products and services. INPUT's estimates of specific revenue and customer base data are summarized in Exhibits IV-6 and IV-7 in Chapter IV. More detailed profiles are included in INPUT's *EDI Vendor Profiles* loose-leaf binder. Also, INPUT publishes a comprehensive set of profiles in its Vendor Analysis Program (VAP), a subscription service that provides ongoing monitoring of the activities and performance of the major vendors in the software and information services industries.

B

Selected Vendor Profiles

1. American Business Computer, 1988 Green Road, P. O. Box 305, Ann Arbor, MI 48106-0305, (313) 930-7840

a. Background and Market

American Business Computer (ABC) is a pioneer in the development of EDI. ABC has gained the knowledge and experience necessary to provide its customer base of over 1,100 companies with a range of EDI-related software products and services. ABC, formed in 1976, operates as a

division of TSM Computing Group. The parent company, Thomas S. Monaghan Inc., is owned by Thomas S. Monaghan, CEO and founder of Domino's Pizza, Inc. and owner of the Detroit Tigers Baseball Club.

b. Products and Services

Software Products - EDI-Server is an EDI gateway for integrating EDI into business environments. EDI-Server combines innovative design methods with advanced Open Systems Interconnect (OSI) principles to provide "seamless" integration of EDI processes into existing practices. EDI-Server enables users, through predeveloped Application Interfaces (APIs), to connect directly to a variety of distributed hosts or to popular local-area networks, including SNA or Ethernet. EDI-Server also interconnects many separately running applications in a corporation. Additional functionality that enhances EDI-Server compared to a less capable translator includes support of X.400 and X.25; preprogrammed local-area network interfaces to SNA (LU 6.2), Ethernet TCP/IP, and DECNET; mailboxing; 4GL report writer and data base; and real-time versus batch processing.

The benefit of an EDI-Server network architecture is that a server eliminates the redundancy of installing individual EDI translators on multiple host-based application systems, thereby reducing the resources and costs required to maintain an EDI program. When EDI activity is localized on a single server, programming efforts and staff requirements can be reduced.

Other ABC software products include EDI-ExCel, a dynamic EDI translator that requires only minimal user technical expertise to get the system up and running, and XLT12, an EDI translator developed for mainframe users that integrates EDI into existing business operations. XLT12 accepts data from an application and translates it to a standard format (X11, VICS, etc.) and then accepts standard data from trading partners and presents the data to the application system in the proper format. EDI-PC is an automotive turnkey product that incorporates the key functionality of EDI and bar coding to provide users with a standalone automotive solution.

ABC has also implemented an Electronic Support Service for its customers, offering bulletin boards, trouble log reporting and update distribution. In addition, ABC provides EDI implementation consulting and will conduct standards and executive EDI training.

2. The APL Group, Inc., 644 Danbury Road, Wilton, CT 06897 (203) 762-3933

a. Background and Market

The APL Group was founded in 1983 for the sole purpose of developing software for electronic data interchange (EDI). The company's products and services include Qualedi^R EDI PC-based translation software, annual

software maintenance and customer support, EDI education, and EDI consulting.

The APL Group has targeted its PC product to be the premier PC-based translator for companies wanting to integrate EDI with existing software applications. These applications may be running on other than PC platforms. APL claims that the underlying relational data base structure of its EDI translator provides the flexibility to respond quickly to changes in the standards.

b. Products and Services

Software Products - Qualedi, originally introduced in 1984, is a micro-based translation software product supporting all public EDI standards. The software is now at release nine (9). Qualedi also has standards-compliance verification abilities. At each level of the EDI transmission (interchange level, group level, and transaction set level) Qualedi verifies that all data elements and segments adhere to the standards. If errors appear, they are reported and in some instances corrected. The Qualedi front-end acts as either a front-end to a mainframe or mini, or as a standalone workstation.

The Qualedi service bureau is an enhanced mode of the front-end system. The user of the system is not the sender or receiver of the documents, as in the front-end mode, but serves instead as the service bureau for a number of internal correspondents who are the real senders and receivers. The user system is, in this case, an interface between multiple internal and multiple external correspondents.

Qualedi operates on any MS-DOS PC/XT-, AT- or 386-compatible micro-computer equipped with a serial port, an internal clock, 640K of RAM and 10-megabyte hard disk, a monochrome monitor, and an 80-character printer. A modem and communication software are required for communications. Qualedi supports the following standards: ANSI X.12 (all industries, including CIDX, AIAG, CDX, VICS); UCS (grocery/retail); WINS (warehousing); TDCC (transportation); and EDIFACT (international). Data communications networks supported by the product include the following: BT North America, TranSettlements, Sears Communication Company, Ford, Telecom Canada, AT&T, OrderNet, Kleinschmidt, GE Information Services, CompuServe, Railinc, and IBM Information Network (APL participates in the IBM Business Partner Program; it is on BT North America's Alliance Partner program; and it signed a national cooperation agreement for marketing, sales, and implementation with AT&T). Additionally, the software supports point-to-point implementations. Communications software supported by Qualedi is dependent on which of the various networks the customer uses.

The APL Group also provides professional services such as customization and consulting services in addition to providing its customers with installation services, a tutorial demonstration, and hotline support.

Qualedi has been installed in 18 different industries, including retail, aerospace, grocery, telecommunications, airline, utility, chemicals, manufacturing, transportation, and distribution. The product has generic capabilities that allow its use in any industry that has endorsed national standards.

3. BT North America, Inc., 2560 North First Street, San Jose, CA 95131, (408) 922-0250

a. Background and Market

BT North America was formed on March 31, 1991 with the merger of BT Tymnet Inc. and British Telecom Inc., the two U.S. subsidiaries of British Telecommunications. BT North America currently operates as an international value-added network and information services provider and is one of the world's largest suppliers of shared, dedicated, and hybrid network solutions. The company owns and operates the world's largest value-added data network—the TYMNET Global Network—which offers protocol conversion, LAN interconnectivity, error correction, and enhanced security features.

BT North America's parent, British Telecom, operates one of the largest communications networks in the world, has annual revenues of over \$20 billion, employs about 240,000 staff and has over 100 offices in 30 countries.

The TYMNET data network was created in 1969 to deliver remote computing services to a widely dispersed population of Tymshare Inc. remote computing clients. In 1977, the company—then called Tymnet, Inc. (a Tymshare subsidiary)—became an FCC-regulated specialized common carrier, and two years later installed its first private network. Tymnet was acquired by McDonnell Douglas in 1984 and was subsequently renamed McDonnell Douglas Network Systems Company (MDNSC). In November, 1989, British Telecom purchased MDNSC and certain other McDonnell Douglas network services for \$355 million in cash.

b. Products and Services

Network Services - The TYMNET^R Global Network is BT North America's value-added public packet data communications network that consists of intelligent communications processors connected by a network of leased telephone lines, microwave links, and satellite channels to

provide worldwide interconnection between remote terminals, microcomputers, and host computers. TYMNET provides value-added services such as error protection, protocol conversion, enhanced data security, EDI, electronic financial transaction services, and electronic messaging.

More than 16,500 simultaneous users in more than 22 countries can directly access TYMNET daily, sending up to 26 billion characters via 4,500 communications processors worldwide. The network supports various protocols, including asynchronous, X.25, X.75, 3270 bisync, 3270 SDLC, RJE HASP, Burroughs Polled-Select, and UTS. For interfacing personal computers to networks, the X.PC and MNP asynchronous error-protection protocols are used.

EDI Application Service - The principal EDI service, EDI*Net^R, is a third-party, value-added communications service for computer-to-computer exchange of such business documents as purchase orders, invoices, and bills of lading. EDI*Net supports all public exchange standards (including ANSI X.12 and EDIFACT), various industry-specific standards, and offers asynchronous, bisynchronous, and leased-line access. EDI*Net clients are predominantly in the transportation, grocery, electronics, telecommunications, aerospace, oil, and warehousing industries.

4. DNS Associates, Inc., 1 Militia Drive, Lexington, MA 02173 (617) 862-8569

a. Background and Market

DNS Associates, founded in 1978, provides EDI software development and consulting services to all industries. Originally formed to provide consulting services to transportation companies and users, the company still offers computer network modeling, primarily to the rail industry. The company is headquartered in Lexington, MA, with sales offices in Philadelphia, PA, Minneapolis, MN, and San Diego, CA.

The company derives 80% of its revenue from EDI software and related services, with the remainder coming from other consulting services in the transportation industry. DNS introduced its EDI software in 1986 and currently markets it to all industries worldwide. The company's products are available for IBM PC, PS/2, and compatibles, DEC VAX, and UNIX systems.

b. Products and Services

Software Products - EDI/EDGE is a flexible EDI document handling system that allows a user to describe and transmit any type of document in any EDI format, while being compatible with all published EDI standards, including ANSI and TDCC. EDI/EDGE includes five major components:

- *User Interface* enables documents to be created, stored, retrieved, printed, and transmitted
- *Files* stores transactions and connects to EDI communications to transmit and receive information electronically
- *Forms* permits the creation and storage of custom designed forms using the specific items required in a format compatible with existing operations
- *EDI Communications* handles both transmission and receipt of EDI transactions (this system runs in a “background” mode so communications can occur simultaneously with other operations)
- *Print* provides a paper copy so the same system can also produce documents for non-EDI trading partners. A physical paper record may also be required for approval signatures and for departments operating in a paper environment.

DNS Associates also provides modifications to EDI/EDGE software, consulting services for forms design, and custom software development, as well as services such as telephone support, the EDI/EDGE Newsletter, and the EDI/EDGE user group.

EDI/EDGE products and services are targeted at all industries and to small to midsized companies as well as industry leaders. The products are designed so that small companies can install and operate with little or no training.

5. GE Information Services, 401 North Washington Street, Rockville, MD 20850, (301) 340-4000

a. Background and Market

GE Information Services (GEIS) currently provides transaction and utility processing, inquiry/response, electronic data interchange, value-added network services, systems integration, and software development and network management professional services to over 13,000 corporate and association clients worldwide. Its focused industries include international banking and financial services, international trade and transportation, retail/apparel/merchandising, telecommunications, automotive/heavy equipment/manufacturing, petroleum/chemical, and high technology.

GEIS was formed in 1979 as General Electric Information Services Company (GEISCO) to consolidate General Electric Company's (GE) MARK III worldwide interactive and remote batch processing services, originally introduced in 1965 under the MARK I name as the first interactive processing service commercially available in the U.S. The organization

unified the U.S. operations handled by GE's Information Services Division with European and Australian operations run by Honeywell. Honeywell retained a 16% interest in GEISCO until January 1972, when GE purchased Honeywell's interest for approximately \$70 million. On January 1, 1984, GEISCO once again became an internal component of GE and its legal name became GE Information Services. GEIS now reports to GE's Communications and Services Organization (CSO), which was formed in 1986 to meld certain GE operations with former RCA units. GE Consulting Services, based in Rockville (MD), was formerly part of GEIS and now operates as a separate unit under CSO. GE Computer Services, based in Atlanta, was also formerly part of GEIS and now operates as a separate unit under CSO.

b. Products and Services

Network Services - The GEIS Network is the company's worldwide teleprocessing network based on a proprietary packet-switching protocol. It permits multi-site organizations to conduct data transmissions with dispersed terminals and host computers around the world. The network has approximately 600 access points in the U.S. and internal direct access in 35 countries.

The network supports asynchronous, IBM-compatible synchronous (including 3270 BSC, 3270 SNA/SDLC, 2780/3780 BSC, 3770 SNA), and X.25 protocols. In addition to supporting SNI interconnections among SNA networks, it also offers a variety of error-correcting protocols, such as MNP and XMODEM, and it provides 3270 emulation via NET*CONNECT 3270 and Simware's SIM 3278, SIMPC, and MAC3270.

The GEIS network uses over 6,000 processing and communications computers, including over 500 minicomputers. Over 400 of these are Bull PMSDs, used to handle communications. Large-scale IBM, Bull and NEC processors are concentrated in supercenters in Rockville, Cleveland, and Amstelveen, Netherlands.

GEIS's network provides clients with local dial-up services in 750 cities in more than 30 countries worldwide and is available 24 hours a day, seven days a week, 365 days a year. Coverage is extended to more than 90 countries by interconnections with public data networks and international record carriers.

Software Products - GEIS offers a number of operating environments from which its many products and services are delivered. These include MARK III, MARK 3000 and MARK 9000 services. MARK III^R Service is used by more than 8,000 clients worldwide, half of whom are based in Europe or have European operations. MARK III's primary application

platform is its Foreground Service, consisting of interactive remote processing on Honeywell/NEC computers. In the MARK III environment, GEIS offers two major libraries consisting of over 2,000 software products, including its Electronic Interchange Products and Services.

EDI products and services support the electronic processing and transmission between trading partners of standard formatted data for business documents in a variety of public and private formats using different protocols and access methods. GEIS' EDI services are used by clients in the transportation, manufacturing, and retail industries. GEIS' EDI network currently connects its large worldwide population of trading partners that send over two million documents a month through the network. GEIS' EDI products are summarized below.

The EDI*EXPRESSTM System, introduced in 1985, provides the capability for sending, receiving, translating, and checking the compliance of EDI messages. The system also provides document and/or interchange level auditing and reporting to the user for tracking and monitoring system usage. Two levels of service are available. The Interchange Level Service, announced in December 1989, enables customers to select a level of service commensurate with the requirements of their applications. The service performs control verification and provides tracking reports for interchanges. The Document Level Service, available since 1987, offers network control verification and tracking at both the interchange and document levels.

EPS*EXPRESSTM Service, introduced in January 1990, permits EDI*EXPRESS clients to initiate electronic payments to their vendors.

The EDI*PCTM System, introduced in 1985, is a software package for IBM and compatible microcomputers that allows trading partners to send and receive EDI documents and status reports in a standard format to and from the EDI*EXPRESS System. It can be used as a workstation or as a front end to an in-house computer for translation.

The EDI*CENTRALTM System, introduced in 1988, is a mainframe software package supporting COBOL 74 for mainframe EDI gateways that support multiple distributed business applications. It allows the client to send EDI data to and from its in-house application system and provides EDI translation between application data and EDI standard formats.

The DESIGN*EXPRESSTM System is a family of products that allows engineering/manufacturing design data to be processed and transmitted electronically in several types of document formats. DESIGN*EXPRESS products became commercially available in the U.S. in 1989.

UPC*EXPRESS Catalog is a service that manages and distributes Universal Product Code (UPC) numbers and their description information for vendors and retailers. The data base of UPC information is integrated with the EDI*EXPRESS System so that vendors and retailers can use EDI to electronically maintain and receive UPC catalog updates.

GEIS also supports several private and industry association networks, including Catspeed (Caterpillar Tractor Company's private EDI implementation), Haggar Apparel Company's HOP (Haggar Order Processing), LeviLink (Levi-Strauss), and PetroEx (the Petroleum Data Exchange System).

In July 1991, GEIS announced the commercial availability of the RETAIL*TALK Service which combines electronic mail, specialized data bases, industry directories, electronic news services, and bulletin boards via a PC-based system designed to complement EDI transactions between retailers and their suppliers.

CARGO*LINK Service is a global network-based service targeted to the trade and transport industries that incorporates EDI for shipment data exchange, data base access for transport business information, consignent tracking, and electronic mail.

GEIS also has EDI-related alliances with various third parties to sell its services along with their software and equipment. The company currently has agreements with ACS Network Systems (Concord, CA) for sales to the apparel industry, American Business Computer (Farmington Hills, MI) for the automotive industry, Can/Am Tech (Hamilton, Ontario) for sales and support in the metals industry, Microdynamics (Dallas, TX) for marketing DESIGN*EXPRESS to the sewn-goods and apparel industry, and Supply Tech (Ann Arbor) for sales to the automotive industry.

GEIS also provides EDI implementation services, including training, conducting trading partner conferences, follow-up conferences with technical support, developing specialized test procedures, customizing documentation, and providing overall project management.

GEIS currently has a client base of over 13,000 corporations and trade associations. GEIS products and services are offered through approximately 50 U.S. offices and international offices in 34 countries.

6. Harbinger Computer Services, 1800 Century Place, Suite 340, Atlanta, GA 30345, (404) 320-1636

a. Background and Market

Harbinger EDI Services, part of Harbinger Computer Services (founded in 1983), is a strategic alliance with Westinghouse Electric, C&S Bank in Atlanta, First Bank System in Minneapolis, and Marine Midland Bank in

Buffalo. The company features EDI PC software and a Tandem-based value-added network (VAN) service for companies wishing to establish EDI links with their trading partners.

Users of Harbinger's network services and software span a variety of industries, including utilities (Southern California Edison, Pacific Power & Light, Consumer's Power (Michigan), telecommunications (Bell Atlantic), manufacturing (Westinghouse, Champion Paper, ALCOA, Abbott Laboratories), and banking (Wells Fargo, First Atlanta, Marine Midland). Other industry specialties include aerospace, retail, health care, and transportation. In addition, Harbinger has licensed its EDI switching/processing software and PC package to Bell Atlantic and U.S. Sprint. Bell Atlantic is using the software to offer EDI network services to clients in its operating domain. Sprint is also offering EDI network services to its corporate clients and, in addition, Sprint is reselling Harbinger software, under a Sprint label, to network providers worldwide (primarily PTTs and other telephone/telegraph companies).

b. Products and Services

Network Services - Harbinger provides EDI network services, using its internally developed EDI switch/hub software (with store-and-forward and other processing functions), which runs on Tandem computers.

Software Products - Harbinger's PC software, called InTouch*EDI, and its front-end processor, InTouch*EDI PLUS, let the user perform EDI without knowing any of the complexities of the ANSI X.12 codes and other EDI standards. InTouch*EDI PLUS allows users to access their own internal applications. Binary file transfer facilitates updates. Easy to install and use, the software works with a mouse and interactive context-sensitive color-coded menus. The software and network services allow users to trade with many trading partners and also permits access to third-party network services.

7. St. Paul Software, 754 Transfer Road, St. Paul, MN 55114 (612) 641-0963

a. Background and Market

St. Paul Software (SPS), founded in 1981, markets applications software products, processing, and associated support services for electronic data interchange (EDI) and electronic data collection (bar code reading and printing) to the manufacturing, distribution, and retail industries and government agencies. The company entered the EDI arena in 1985 when it developed a custom system for a supplier to Burlington Northern Railroad. SPS now supports clients in the U.S., Canada, and Mexico.

b. Products and Services

Software Products - SPS' products support ANSI X12, TDCC, WINS, UCS, EDIFACT, AIAG, and VIC standards, and the company currently has over 350 product installations.

Datatrax, introduced in 1988, is a mini/mainframe-based EDI software package. The product is an EDI translator/generator for over 150 operating systems and hardware platforms, including UNIX, XENIX, AIX, OS/2, ULTRIX, VMS, and ITX. User configurable document tracking permits the monitoring of communications sessions, envelopes, functional groups, or document levels. Archiving and deleting capabilities allow purging of documents. In addition, audit trail functions allow users to print problem data, summary information, or all detail information, and users are alerted to exceptions without analyzing all the detail.

EDI/Gateway, introduced in 1990, is a UNIX-based EDI event-driven client/server product featuring a task scheduling management tool, direct and/or added network mailboxes, full EDI translation and document control, and standard open systems connectivity tools to transfer electronic data to multiple hardware platforms.

EDI/FAX Server, introduced in 1991, provides connections for non-EDI-capable trading partners with an automated EDI-to-fax processing platform. Interconn, introduced in 1985, is a microcomputer-based EDI software package.

Auto-ID, introduced in 1989, is an option that permits the scanning of shipping labels as shipments are being loaded. Auto-ID automatically generates ANSI X.12 Advance Ship Manifests. EDI Service Bureau, also introduced in 1989, enables users to be viable trading partners regardless of transaction volume. With minimal investment, low volume or key account processing is handled by SPS. Data exchange is provided with fax, remote data entry, or computer-to-computer options.

Other services provided by SPS include EDI educational seminars, consulting, installation, product training, custom integration, and hotline technical support.

SPS' target market for its software products includes manufacturers, retailers, and distributors. SPS also has marketing agreements with various dealers to distribute its software products throughout the U.S.

8. Sterling Software, Inc. - EDI Group, 4600 Lakehurst Court, P.O. Box 7160, Dublin, OH 43017-0760, (614) 793-7000

a. Background and Market

Sterling Software's EDI Group specializes in EDI services and proprietary software products. Sterling has been offering third-party EDI network services through its ORDERNET Services Division since 1978 and has over 4,000 U.S. and Canadian network service clients representing a variety of industries.

The EDI Group's strategy focuses on maintaining a close relationship with customers. The company claims to host the largest user group meeting offered by any EDI service provider, with a wide variety of workshops and industry participants.

The EDI Group was created in October 1990, and includes the following divisions:

- Sterling's existing ORDERNET Services Division, headquartered in Dublin (OH), provides EDI network services, communications and translation software products, EDI-related data base services, and education services.
- The EDI International Division, headquartered in London, is a newly formed division created to expand Sterling's EDI business overseas.
- The EDI Labs Division, headquartered in Dublin (OH), is a newly formed division that provides technical support for the ORDERNET Services and EDI International Divisions. The division is also responsible for the development and support of all software products and systems for Sterling's EDI network services and for EDI software users. The EDI Labs Division will focus on development of the next generation of EDI software and systems.

In mid-1991, Sterling purchased the assets of Control Data Corporation's REDINET Services Division, a supplier of network services and software for EDI. The REDINET operations will be included in the ORDERNET Services Division.

b. Products and Services

The ORDERNET Services Division provides EDI network services and software products to customers in the pharmaceutical, grocery, hardware and housewares, retail, medical/surgical distribution, mass merchandising, warehousing, transportation, and automotive industries.

Network Services - Using Sterling's data center in Dublin (OH), ORDERNET provides an on-line network to manage and control the flow of standardized business documents between trading partners that regularly transmit electronic documents to one another. Over 4,000 customers used ORDERNET Services' EDI network services. ORDERNET Services also offers DOCULINK, a series of communications software packages that are built to emulate the communications protocols used most commonly in micro, mini, and mainframe computers and will, with the appropriate internal or external modem, transmit and receive data with the ORDERNET network. MarketQuestTM, introduced in 1989, is a data base service that builds on EDI documents, such as purchase orders and invoices, that trading partners send during the normal course of their business.

Software Products - With the acquisition of Metro-Mark and Control Data's REDINET, ORDERNET Services has expanded its EDI translation software to support the following platforms:

IBM 30XX, 42xx, 9370 under MVS and DOS/VSE
DEC VAX under VMS
IBM S/36, S/38, and AS/400
IBM PC and PS/2 families and compatibles
Data General

Features of Sterling's software include support for X.12 and its subsets, thorough compliance checking, and comprehensive on-line maintenance.

ORDERNET Customer Services representatives assist clients in EDI implementation and provide ongoing support. The Vendor Implementation Program (VIP) assists major purchasers in bringing their suppliers into the EDI environment. EDI installation and training seminars are conducted monthly and provide attendees with an overview of EDI standards, network services, translation software, communications concepts and equipment, installation and testing procedures, trading partner issues, and system audits and controls.

**9. Supply Tech, Inc., 1000 Campus Drive, Ann Arbor, MI 48104
(313) 998-4000**

a. Background and Market

Supply Tech, Inc., founded in 1984, initially developed IBM PC-based electronic data interchange (EDI) software for the automotive industry. Supply Tech is expanding its markets to cover other industries that use EDI throughout the world. The company's products focus exclusively on bar coding and the EDI marketplace.

b. Products and Services

Software Products - STX^R is Supply Tech's microcomputer-based general-purpose EDI software product. STX supports the electronic exchange of business transactions, including releases, advance ship notices, purchase orders, purchase order acknowledgements, requests for quote, quotes, invoices, remittance advice, bills of lading, and CAD files. STX also supports all ANSI X.12, TDCC (Motor, Rail, Air, Ocean), EDIFACT, and UCS transactions, including the various industry-related standards such as AIAG, WINS, VICS, EDX, CIDX, and TALC. STX for the microcomputer runs on IBM and compatible microcomputers and offers connectivity to most public and private EDI networks.

STX^R for the mainframe, introduced in 1990, is used with IBM mainframes running DOS/VSE or MVS using VSAM and CICS. It supports all ANSI X.12, TDCC, and UCS EDI transactions, including all of the industry-related standards. EDIFACT was expected in mid-year, 1991. STX was ported to the IBM mainframe under a joint agreement with Dana Corporation. The product is compatible with STX for the microcomputer.

Supply Tech's patented approach to EDI translation solves the issues of EDI standards version levels and trading partners' unique EDI formats in a single, combined device, known as an Overlay. Although Supply Tech provides regular Standards Updates, it also uses these updates as a reference point for developing an Overlay. STX performs translations based on an Overlay and handles an unlimited number of Overlays. Consequently, any number of standards version levels and trading partner variations are handled concurrently.

STBAR^R is Supply Tech's bar code labeling software product for IBM and compatible microcomputers running MS-DOS.

10. TSI International, 45 Danbury Road, Wilton, CT 06897 (203) 761-8600, (800) 234-5566

a. Background and Market

TSI International develops and markets software products for IBM mainframes and PCs with a special focus on solutions for the delivery of data to production systems. TSI addresses the market needs of traditional (manual) data entry as well as EDI. Founded in 1967, TSI successfully developed and marketed systems software products in the IBM mainframe software market, culminating in the 1978 introduction of KEY/MASTER, which grew over the following years to become the world's leading data input software system.

In June 1989, Warburg, Pincus Ventures, the venture group of E. M. Warburg, Pincus & Co., Inc., chose TSI as a vehicle for an undisclosed, but purportedly substantial capital investment in the EDI market. The capital infusion made its most dramatic impact in 1990 when TSI launched its own mainframe translation software product, Trading Partner. During 1990, TSI also acquired the license and customer base to TranSettlement's TranSlate EDI software for IBM mainframes and acquired the PC-translator company Foretell Corporation (from JWP, Inc.).

b. Products and Services

Software Products - PC KEY/MASTER is a menu-driven data input software system designed to suit the requirements of remote, casual users as well as decentralized, high-volume, data input users. Written in C, PC KEY/MASTER runs under PC-DOS on the IBM XT, AT, PS2, or any compatible PC and on any PC-DOS-compatible networking software, such as Novell's Netware and IBM's Token Ring.

Trading Partner is a high-performance, mainframe-based EDI management software package. It includes a translator for generating and validating EDI standard formats. The translator supports North American EDI implementations, the EDIFACT international standard, and user-tailored variations. Trading Partner also supports a communications gateway for network-independent data transmission between partners, an Applications GatewayTM for importing data to and exporting data from applications systems, an administrative component for maintaining partner profiles and tailoring EDI exchanges to meet the special needs of each EDI partnership, and an audit facility for tight monitoring and control of outgoing and incoming data.

TranSlate is an EDI translation software package that has been installed on a variety of platforms, including IBM mainframes (MVS and DOS/VSE), Unisys, Hewlett-Packard, Honeywell, Tandem, and DEC. TSI purchased the license to this package and has upgraded it. ESP II is EDI translation software designed for PCs. It runs in a Microsoft's Windows environment and makes use of the environment's multitasking capabilities.

KEY/MASTER provides for data input to production applications and data bases from on-line 3270 terminals, off-line PCs and LANs, and non-keyed sources such as bar codes, scanners, OCR, imaging, and ATMs. KEY/MASTER runs on IBM mainframes under all current versions of VSE, MVS, and VM/CMS.

With its mainframe products, TSI markets to large Fortune 1000 companies across all industry categories including manufacturing, distribution, transportation, health care, grocery, retail, and finance.

11. IBM Information Network, P.O. Box 30021, Tampa, FL, 33630 (813) 878-3000

a. Background and Market

The IBM Information Network, IBM's international value-added network, offers inter- and intra-enterprise networking services that allow companies to interconnect people and systems (IBM and non-IBM) around the globe.

Value-added services that address specific business communications needs include electronic mail, electronic data interchange (EDI), access to commercial data bases and information services, and remote computing services.

IBM Information Network (IBM IN) operates an international network with leased-line and dial access available from hundreds of cities in more than 83 countries. Customers can use the network to outsource their network implementation or to extend the reach of their existing network. IBM IN supports SNA and non-SNA based systems.

b. Products and Services

IBM IN has offered EDI services since its commercial debut of the network in the early 1980s but it wasn't until 1990 that it entered the EDI market with a vengeance. In that year, it rolled out a full line of EDI translation software, the IBM expEDIte[®] DataInterchange Series, and began aggressively signing up hub (or, as IBM calls them, "sponsor") companies in a focused marketing program. It also created an IBM Solution Center.

IBM's expEDIte DataInterchange Series of translation software includes packages that run on MVS, AS/400, System 3X, OS/2 and AIX operating systems. Through its QuickEDI service programs, where IBM IN helps a hub company bring up all of its trading partners on EDI, IBM IN offers a PC (MS-DOS) translation package.

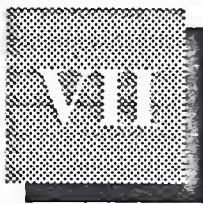
The translation software supports the ANSI X12, UN/EDIFACT, UN/TDI and UCS EDI data standards.

IBM IN is interconnected with the following other EDI network services: ARI Network Services, Inc., AT&T, BT North America, CompuServe, Harbinger Computer Services, GE Information Services, Kleinschmidt, Inc., Sears Communication Company, Sterling Software ORDERNET, Telecom Canada, and TranSettlements, Inc.

For a more detailed profile of IBM Information Network and other EDI vendors, please refer to INPUT's *EDI Vendor Profiles*.



Conclusions and Recommendations



Conclusions and Recommendations

A

Conclusions

While the overall proportion of commercial transactions facilitated by EDI grows slowly, EDI is being implemented in more and more diverse industries (such as education, construction, and film distribution). Although the U.S. economy continues to show recessionary characteristics, EDI continues to grow at a steady rate. INPUT expects this moderate growth rate to continue for the forecast period, and as a result of INPUT's research, including surveys, interviews, analysis of media documentation, monitoring of financial reporting, and interpretation of trade association and regulatory activity, INPUT draws the following conclusions

- EDI's slow growth will continue. One reason growth is slow is that many who attempt to implement EDI underestimate the level of commitment required and become discouraged. Other reasons include a lack of critical mass and the absence of strong, industry- or economy-wide imperatives supporting EDI. But slow is a relative term, and even though EDI has never quite lived up to its initial proponents' enthusiastic growth projections, EDI customers do project, over the period 1992-1996, a 22% compound annual growth rate (CAGR) in their expenditures for EDI network services, a 19% CAGR for EDI software services, a 20% CAGR for EDI-related professional services, and an overall CAGR of 21% for all EDI expenditures.
- A few large companies (such as GEIS, Sterling and IBM) will continue to be the dominant vendors of EDI products and services across all EDI product and service market segments.
- Within each market segment, the top two vendors (in terms of annual sales of EDI products and services) account for 47% to 51% of all EDI sales to that market. (Note that for the sake of this analysis, delivery platforms were not combined when measuring software markets. If they had been, the top three companies would have held 47% of the total EDI software sales market.)

- Professional services, although currently experiencing the effects of user spending constraints due to the recession and a slowing of new installation activity as fewer new (to EDI) customers install systems, can still be expected to have a 20% CAGR over the next five years. Although revenues are temporarily down, so are the staffs of the PS vendors, allowing efficient operation and good profit potential in the current market, while providing the nucleus for growth as the market expands.
- Improved operational efficiency has emerged as the primary objective of EDI programs and the most frequently observed benefit. And regardless of company size or industry grouping, the most popular perceived EDI benefit is its improvement of the way companies do business.
- The most popular integrated (e.g., software-to-software) applications continue to be purchasing and activities associated with purchasing. No surprise here!
- Most companies (67%) use only basic VAN services for EDI. E-mail (38%) and EFT (27%) are the next most popular network offerings.
- A generic need for real-time EDI is still undefined, although 12% of INPUT's survey population said they were doing it and half said that they would like it.
- Some industry segments offer better EDI opportunity than others. Based upon INPUT's EDI expenditure forecasts, process manufacturing offers the best 12-month growth in anticipated EDI expenditures at 40%, followed closely by the transportation industry (39%) and distribution industry (38%). These three industry groups will offer an excellent marketing opportunity to suppliers of EDI products and services.
- When asked what they felt the main issues were regarding EDI, vendors of EDI products and services unanimously responded that increasing the size, diversity and transaction volume of the EDI user community was the most important.

In addition to the conclusions noted above, INPUT feels that the following statements, contained in last year's annual report on the EDI market, continue to be valid:

- EDI will not be pervasive or ubiquitous. Other communication media will exist side by side with EDI, such as the telephone, facsimile, face-to-face negotiations, interactive systems, E-mail, and paper. EDI will be selectively implemented by companies only when circumstances warrant it—primarily, where transaction volumes for repetitively ordered commodity products are high.

- The potential for simple EDI translation software is limited. Software vendors need to look beyond simple translation and develop applications.
- The potential for network services is also limited in that critical, value-adding functionality is or can be done on software located at the user's site, employing the user's hardware and network resources. This migratory path (VAN to in-house) tends to be cost-driven and as EDI volumes increase, users are motivated to reduce incremental costs by going in-house, where the cost plateaus are much broader. This is the same path followed in past years by time-sharing users. First they used pay-as-you-go, transaction-based resources, then as volumes and costs rose, took the applications in-house.
- Markets are emerging for commercial transaction data (consumer and business point-of-sale data, EDI transactions, etc.). Electronic technologies make this data easily obtainable, transferable, and therefore, marketable. Citicorp, IMS, Sterling, and Dun & Bradstreet are leaders in this area with regard to EDI transactions. INPUT's Electronic Commerce Program covers this area in detail.
- EDI embodies some fundamental economic realities that are not yet fully understood. It reorganizes businesses, industries, and economies. It redefines organizational entities within the macro-economic system. Buyers and sellers become more integrated. Industries become integrated as a result of collectively defining standards. Vendors are often users. Users are often vendors. Competitors form consortia (as in the case of transaction data bases). Within a single company, departmental boundaries and job descriptions are redefined because, properly implemented, EDI touches all the functional groups of a company (sales, manufacturing, accounting, shipping), and buyers, product designers, production-line workers, sales personnel, accounting staff and other workers become a single team. Sorting out these complicated, interdependent issues is part and parcel of implementing EDI. This explains why EDI, which on the surface is a simple and indisputably good idea, is growing so slowly.
- There may be a "macro" 80-20 rule governing the implementation of EDI which sets the upper limits of its adoption in the economy. Eighty percent of the U.S. GNP is produced and distributed by 20% of its companies. When the key 20% of the economy's companies have established comprehensive and effective EDI programs, there may be little marginal value to the economy of adding other companies.

Recommendations

The following recommendations have been grouped according to their applicability to users, network providers, software vendors and professional services providers.

1. Users

- Consider EDI to be part of a larger business strategy. Position EDI to support closer relationships with trading partners and to support better information systems for management. Also, consider how you can work with other companies in your supply chain to improve the chain's overall coordination and efficiency. Talk with network vendors about what they can offer.
- Shop around. There are many suppliers of EDI products and services. It's a buyers' market. Rely on network providers and software vendors for implementation plans and training (which they often provide for free).
- Build EDI capabilities with key trading partners. Establish EDI linkages with customers as they request it. Establish EDI linkages with suppliers where you will realize the greatest reduction in transaction costs. Use other communication media for other trading partners and transactions. Don't attempt to completely convert every trading partner to EDI.
- Prepare for organizational evolution. Develop a strong understanding and consensus among employees regarding how to keep customers satisfied. Build information systems (computer- and paper-based) that support good management control procedures for insuring customer satisfaction. Stress teamwork and employee participation. Develop/revise accounting systems and methods so as to capture relevant management data as quickly as possible.
- Get involved in the X.12 and EDIFACT standards organizations, and/or your industry trade group responsible for setting EDI guidelines.
- Join or help establish an EDI users' group in your area.

2. Network Providers

- Target specific industry sectors (retail, electronics, utilities, etc.) and offer turnkey solutions to customers.
- Establish an implementation program to help large accounts bring up EDI trading partners.

- Offer software, systems integration, education and training to EDI customers.
- Sell EDI in a “hub and spoke” approach. That is, sell simultaneously to a large company and its many trading partners.
- Develop advanced capabilities, particularly data base services and services providing information on transactions.
- Offer business brokering services. Make these services an expansion of your trading partner implementation programs.
- Offer financial EDI services either through alliances with banks or through your own services.

3. Software Vendors

- Develop integration tools such as mapping tools, application interfaces, and event-driven architectures).
- Establish technical and/or marketing alliances with application developers. Make it easy for users to link applications software to your translation software.

4. Professional Services Vendors

- Focus on integration services (and watch out for competition from network service companies).
- Offer systems maintenance and optimization services.
- Seek customers who are large hub companies that have many spoke relationships.
- Target vertical industries.

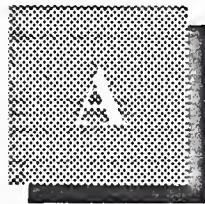
Exhibit VII-1 summarizes some of the key recommendations for vendors of EDI products and services.

EXHIBIT VII-1

EDI Vendor Recommendations

Recommendations	Network Providers	Software Vendors	Professional Services Firms
Target vertical industries	✓		✓
Offer systems integration support	✓	✓	✓
Offer advanced services and new features	✓	✓	
Target hub companies	✓		✓
Seek alliances	✓	✓	✓

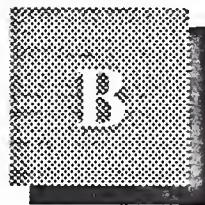
Appendices



Definitions

For definitions of EDI terms, please see glossaries contained in other INPUT EDI reports such as *EDI: Business Integration Issues (1990)*, *EDI Intertrends North America (1989)*, or *EDI Advanced Services (1989)*.

For further definition of delivery modes and INPUT's taxonomy of the information services market, please see Appendix A of INPUT's report, *Industry Sector/Cross-Industry Markets* (one of the reports of INPUT's Market Analysis Program).

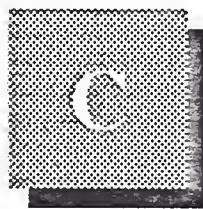


EDI Market Forecast by Delivery Mode, 1991-1996

EXHIBIT B-1

EDI Market Forecast by Delivery Mode, 1991-1996 (\$ Millions)

Delivery Mode	1990 (\$M)	Growth 90-91 (%)	1991 (\$M)	1992 (\$M)	1993 (\$M)	1994 (\$M)	1995 (\$M)	1996 (\$M)	CAGR 91-96 (%)
Total EDI Market	146	17	231	283	348	416	499	596	21
EDI Software	42	14	48	57	68	80	95	112	19
EDI Network Services	123	20	148	185	231	277	333	399	22
EDI Professional Services	31	13	35	41	49	59	71	85	20

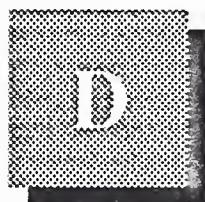


Forecast Reconciliation

EXHIBIT C-1

Forecast Reconciliation (\$ Millions)

Delivery Mode	1990 Market			1995 Market			90-95 CAGR per data 90 rpt (%)	90-95 CAGR per data 91 rpt (%)
	1990 Report (Fcst) (\$M)	1991 Report (Fcst) (\$M)	Variance from 1990 Report (\$M) (%)	1990 Report (Fcst) (\$M)	1991 Report (Fcst) (\$M)	Variance from 1990 Report (\$M) (%)		
EDI	117	196	79 68	276	499	223 81	14	21



EDI User/Vendor Questionnaire

Dear EDI User, your input is most important to us:

We want to know how your EDI program is coming along and how it fits into the larger business and information technology strategy of your company. Your response to the following questions will provide us with a picture of the trends, opportunities, and driving forces of EDI and related technologies. In return for completing this questionnaire, we will be pleased to send you an Executive Overview of the survey analysis. By the way, all responses are confidential.

Please mail your completed questionnaire by July 31, 1991 to: Torrey Byles, INPUT, 1280 Villa Street, Mountain View, CA 94041-1194, or fax it to (415) 961-3966.

1. Are you a vendor of EDI products and services, a user of EDI products and services, both, or another kind of organization (e.g., trade association)?

2. In which of the following industry categories does your company/division belong? (check one only)

<input type="checkbox"/> Discrete Manufacturing	<input type="checkbox"/> Insurance
<input type="checkbox"/> Process Manufacturing	<input type="checkbox"/> Medical
<input type="checkbox"/> Transportation	<input type="checkbox"/> Education
<input type="checkbox"/> Utilities	<input type="checkbox"/> Business Services
<input type="checkbox"/> Telecommunications	<input type="checkbox"/> Federal Government
<input type="checkbox"/> Retail Distribution	<input type="checkbox"/> State and Local Government
<input type="checkbox"/> Wholesale Distribution	<input type="checkbox"/> Consumer and Home
<input type="checkbox"/> Banking and Finance	<input type="checkbox"/> Other (specify) _____

3. What is the specific industry group of your company (e.g., grocery, aerospace, etc.)?

4. What is the approximate size (number of employees) of your company?

<input type="checkbox"/> Under 100	<input type="checkbox"/> 500-999
<input type="checkbox"/> 100-499	<input type="checkbox"/> 1000 and over

5. What are your company's approximate annual revenues?

<input type="checkbox"/> Under \$19 million	<input type="checkbox"/> \$100 million to \$499 million
<input type="checkbox"/> \$20 million to \$49 million	<input type="checkbox"/> \$500 million to \$999 million
<input type="checkbox"/> \$50 million to \$99 million	<input type="checkbox"/> Over \$1 billion

6. How much did you spend on each of the following items in 1990 and how much do you plan to spend on each in 1991?

	1990	1991
Third-party EDI software	_____	_____
Internal EDI software development	_____	_____
EDI network services	_____	_____
EDI consulting/programming by outside consultants	_____	_____
EDI conferences, educational materials	_____	_____

7. How many full-time people work on the EDI project in your company? _____

8. List your three core objectives for implementing EDI.

9. With how many suppliers do/will you conduct EDI:

Now _____ 12 months from now _____

10. With how many customers do/will you conduct EDI:

Now _____ 12 months from now _____

11. How many message units/transaction sets does the EDI translation software currently process per month? _____

12. How many message units/transaction sets do you anticipate the software will process per month 12 months from now? _____

13. With EDI, has the number of messages sent changed compared to when the messages were in paper form?

<input type="checkbox"/> Increased	<input type="checkbox"/> About the same
<input type="checkbox"/> Decreased	

14. Which of the following best characterizes the stimulus for your EDI program?

<input type="checkbox"/> Customers are asking you to adopt EDI
<input type="checkbox"/> You are asking your suppliers to adopt EDI
<input type="checkbox"/> Other (explain) _____

15. Of the following methods for receiving purchase orders from your customers, please estimate (as a percentage of the total) how much each one is used.

	Percent of Transactions	Percent of Dollar Volume
Field sales representatives	_____	_____
Walk-in, showroom orders	_____	_____
Phone conversation	_____	_____
Mail POs/invoices	_____	_____
Interactive voice response	_____	_____
Facsimile	_____	_____
On-line electronic order entry	_____	_____
EDI	_____	_____
Other (_____)	_____	100

16. EDI won't be used for all communications with all customers and suppliers. What conditions can you identify that warrant the use of EDI?

Small dollar amounts Only those trading partners that request it
 Repetitive orders with Other (explain) _____
 major trading partners

17. On a scale of one to five (five being most satisfied), how satisfied are you with your EDI program? (please circle)

Least satisfied 1 2 3 4 5 Most satisfied

18. What quantifiable impact has EDI had on your company?

19. Which of the following devices are used to collect or carry data that is used in the EDI transmission? Check all that apply.

<input type="checkbox"/> Bar code scanners	<input type="checkbox"/> Local-area networks/office environments/E-mail systems
<input type="checkbox"/> Portable computers	<input type="checkbox"/> Smart cards or any magnetic stripe card
<input type="checkbox"/> Hand-held data collection devices (excluding bar code scanners and portable computers)	<input type="checkbox"/> Image systems

20. Of the following applications, please indicate which are integrated into your EDI software. "Integrated" means that data generated or used in the following system/application are directly transferred into or out of EDI transmissions with trading partners without any human rekeying of data.

<input type="checkbox"/> Sales/order entry	<input type="checkbox"/> Manufacturing resource planning
<input type="checkbox"/> Purchasing	<input type="checkbox"/> Traffic management/logistics/transportation
<input type="checkbox"/> Accounts payable	<input type="checkbox"/> Inventory control/receiving
<input type="checkbox"/> Accounts receivable	<input type="checkbox"/> Other _____
<input type="checkbox"/> Funds transfer	

21. What third-party network services do you use? Check all that apply:

<input type="checkbox"/> On-line product catalogs; data bases; directories
<input type="checkbox"/> Converting EDI transmissions to paper or facsimile
<input type="checkbox"/> Graphics files transfers
<input type="checkbox"/> Trading partner implementation programs
<input type="checkbox"/> Reports on distribution chain activity; marketing/sales activity reporting
<input type="checkbox"/> Interactive voice response services
<input type="checkbox"/> Buy-sell bulletin boards
<input type="checkbox"/> Electronic mail
<input type="checkbox"/> Electronic funds transfer
<input type="checkbox"/> Other (please explain) _____
<input type="checkbox"/> Just basic services (store and forwarding of messages; compliance checking; monthly audit reports)
<input type="checkbox"/> Don't use a VAN at all

22. Are you planning to decrease, increase, or keep unchanged your reliance on third-party value-added networks in the future?

<input type="checkbox"/> Decrease	<input type="checkbox"/> Keep the same
<input type="checkbox"/> Increase	<input type="checkbox"/> Don't use a VAN

23. Does your company have a local-area or wide-area network?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

24. Do you have any need for conducting EDI in a real-time mode instead of a batch mode? Would you like to see some EDI transmissions done in a real-time mode in the future?

<input type="checkbox"/> No need	<input type="checkbox"/> Would like to have real time
<input type="checkbox"/> Already doing this	

25. How many different departments or divisions in your company are conducting EDI? _____

26. Does each department/division have its own translation software or do they access centralized software on a network?

27. What are your plans for international EDI use?

- Already doing it. How many trading partners do you have? _____
- Plan to do it in the next 12 months
- Plan to do it in the next three years

28. Are you using EDI/EFT to pay or receive payments from trading partners (please do not count lockbox payments)?

Yes No

If yes, with how many trading partners?

If yes, with how many trading partners?
If no, will you in the next 12 months?

Yes No
 Don't know

Optional information (*necessary to receive your free Executive Overview*):

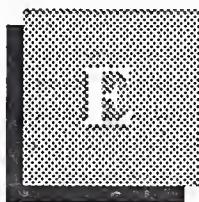
Your name: _____

Your title:

Your company:

Address:

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